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# LOGIC-----

*^he Art of Defining*

*and Reasoning*

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BOO?

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## PREFACE

The aim of this book is to present the basic doctrine of logic for an introductory course. The book is based upon the *Organon* of Aristotle, in which the fundamental doctrine of logic is given in its proper order. The text also relies upon the great commentators on Aristotle, especially St. Thomas Aquinas and St. Albert the Great. Dependence upon these authors is evident throughout the book. Contemporary authors on logic have been consulted as well.

So far as possible, the doctrine of logic is presented in ordinary language, with many examples. Some of the technical terminology of logic has been sanctioned so completely by time and use that it has become a necessary part of the vocabulary of a logic text. In other respects, points are presented more flexibly and informally. In general, only essential matter is included in the text in order to concentrate on points that should be covered in any introductory course in logic. The workbook form has been adopted to insure at least a minimum amount of exercise work in developing the art of logical thinking.

The division of logic according to the three acts of the intellect is based upon the Commentary of St. Thomas Aquinas on Aristotle's *Posterior Analytics*, Lesson I. Part One of the book is almost exclusively material logic. Definition is the most important topic in this first act of the intellect, for it manifests the simple object most perfectly. The predicables and the categories are treated, which, though somewhat difficult for an introductory course, are indispensable for understanding definition properly.

Part Two, the logic of the act of composition or division, is primarily formal logic. In general, the order of Aristotle's *On Interpretation* is followed. It is here that the consideration of the complex object begins. An emphasis has been placed on supposition as a property of the parts of a proposition, since the notion of supposition is frequently neglected, or is erroneously considered in the logic of the first act of the intellect. Modal propositions are mentioned briefly, but opposition of modal propositions is omitted because of its difficulty for an elementary course.

Part Three, the logic of the third act of the intellect, concerns the act of reasoning, by which we proceed discursively from one thing to another so as to arrive fully at a knowledge of the complex object. This part of logic, even in an introductory textbook, should be treated from the standpoint of both formal and material logic. Consequently, after the usual presentation of the syllogism and induction on the part of form, there is a summary of argumentation on the part of matter. In this way, it is possible to indicate, at least, the nature of demonstrative reasoning, dialectical reasoning, rhetorical and poetic argumentation. The final chapter, on sophistical reasoning, treats defective reasoning on the part of matter. All of these topics can be developed more fully, if time permits, by reference to the appropriate places in the *Organon* of Aristotle.

There is no reference throughout this text to what is called "symbolic" logic. This absence of reference does not imply that symbolic logic is not important or should be ignored; the contrary is rather the case. However, in approaching logic, it is important, first, to have a sound understanding of logic itself, apart from any mathematical approach to logic, which is a distinct and posterior consideration. Furthermore, symbolic logic cannot perform the role that traditional logic, the logic basic to the human mind, fulfills. Symbolic logic is the appropriate instrument for the experimental method of science, in so far as experimental science is mathematical. Traditional logic, logic in the unqualified sense, is the method of philosophy and of knowledge generally. It is important, therefore, in an introductory course in logic, to begin with the fundamental notions and correct order of logic itself.

Two brief excerpts have been added in the Appendix. The first is from Lesson I of the Commentary of St. Thomas Aquinas on Aristotle's *Posterior Analytics*. This excerpt gives the order and parts of logic in a comprehensive glance. The second is Chapter One of Aristotle's *On Interpretation*, with the first three lessons of the Commentary of St. Thomas. This excerpt contains some important doctrine on notions introductory to the second act of the intellect. It can also be used as a model for the reading, outlining, and analyzing of an important text. In going through this Commentary, one can learn how to read an important text both critically and in an orderly manner.

I am greatly indebted to my colleagues in the Department of Philosophy at the College of St. Thomas for assistance and encouragement in preparing this book. They have tried out portions of the text in mimeograph form in class and have helped me to make necessary alterations and corrections. I am also indebted to my wife, who

translated the portion from Aristotle's *On Interpretation* as well as the St. Thomas Commentary, and who assisted me in the editing of the manuscript.

J. A. O.



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Excerpt from Aristotle's *On Interpretation*, Chapter One,  
with Commentary of St. Thomas Aquinas, Lessons I, II,  
and III.



## *Introduction*

# MEANING AND DIVISION OF LOGIC

WHAT is logic and why should we study logic? We might begin our answer to this question by observing that everyone naturally desires to know. This self-evident statement simply means that a human being is so constituted that he cannot help wanting to know. A human being is a knowing being.

But what kind of knowing? We know in various ways. For example, I know that a dinner is cooking by smelling it. I know that a man is in a chair by looking at him. I know what New York looks like by remembering my visit there a year ago. In a more complex way than in any of the preceding examples, I know that sooner or later I shall die; even more, I know that every man dies and why every man must die.

What kind of knowing do we mean, then, when we say that everyone naturally desires to know? In the sense that every human being is so constituted that he cannot help wanting to know, every kind of knowing is included. But if we take the statement to mean the kind of knowing with which a human being is distinctively concerned, then the statement applies properly to the last kind of knowing. The last kind of knowing is *reasoned* knowing.

What do we mean by reasoned knowing? It is that kind of knowing by which we find out *why* this or that is so. Thus, if someone asks me why every man must die—why every man is mortal—I have to give him some reason for accepting the statement as true. In brief, I have to prove it. This kind of knowing is distinctively human knowing, for we do not go about proving to horses or cows or even apes that they, too, must die, although it is just as true that they die as it is that human beings die.

All human beings, then, in varying degrees, want to know why things are so. An evident sign of this is that even as children we frequently ask for the *why* of things. We are insatiably curious. This universal

wonder of human beings is never entirely smothered, although we often disregard its promptings. As the ancient Greeks declared, wonder is the starting point of knowledge. Wonder is the starting point in the sense that we wonder what can be the explanation or cause of the things that we are continually observing. It is only when we do know the cause of a thing that our wonder ceases about that thing, for only by knowing the cause is our wonder fully satisfied.

Now logic is nothing else than the art that guides us in coming to know something previously unknown to us. Logic, then, is an instrument for helping us to find out why things are as they are. An axe is an instrument for cutting down a tree. A sharp axe is an efficient instrument for cutting down a tree. The power of thinking is an instrument for knowing the why and wherefore of things, but thinking sharpened by skill in logic is an efficient instrument for scientific knowing. We thus have at least a preliminary answer to what logic is and why we should study it. If every human being wants to know, in some degree, and if logic is an indispensable means of obtaining knowledge more easily, more surely, and more efficiently, then the study of logic is of use to every human being.

Let us now investigate in greater detail what logic is about and how we reason in a logical way. Suppose that you were walking down a street on a wintry day after a heavy snowfall. The sun is out and shining brightly. You notice the shining of the sun in particular because your eyes are bothered by the reflection of the sun on the snow. The thought might occur to you how much the snow reflects the light of the sun. This thought, in turn, might call your attention to the whiteness of the snow. You would recognize at once that the whiteness of the snow was the reason for the bright reflection of the snow in your eyes.

In this very ordinary example, you have informally gone through a reasoning process. You started with the statement *Snow reflects light*. You proceeded almost immediately to give the reason why snow reflects light, namely, *Snow is white*. The first statement follows from the second statement, and the two statements can be put down in the following order:

Snow is white.  
Therefore, snow reflects light.

The word “therefore” indicates that the second statement follows as a conclusion from the first. Now if you analyze these two statements, you will notice that there is a third statement implicitly contained in them, a statement containing the words “white” and “light.” This

third statement would read: *White reflects light*. You would then have three statements, appearing in the following order:

White reflects light.  
Snow is white.  
Therefore, snow reflects light.

This full argument is called a syllogism. It is a movement of our power of reasoning that grasps the truth of a conclusion by seeing the truth and connection of the two propositions leading to the conclusion. Logic guides us in knowing how to construct an argument like this, a kind of knowing, as we shall see, that is demonstrative knowledge. But to know what a syllogism is, and how to construct a syllogism, we have to know the parts of a syllogism, just as we have to know the different parts of a house in order to build a house.

The most immediate parts of a syllogism are the propositions of which it is composed. Logic will help us understand what propositions are, and what their relation is to each other, so that from them we can make good arguments, or syllogisms, and thus demonstrate what we know.

There are, however, other parts of a syllogism besides propositions. Words, which signify concepts, also make up a syllogism; for instance, "snow," "light," and "white" were parts of the syllogism given above. Words, in fact, are parts of propositions as well as parts of syllogisms. The words "snow" and "white" are parts of the proposition *Snow is white*. "Snow" and "white" are also parts of the syllogism given above, but they are parts of a syllogism differently from the way in which they are parts of a proposition, as we shall see later.

The syllogism given above was chosen deliberately to bring out the need of knowing the parts of a proposition before knowing the whole proposition; it also brings out the need of knowing the parts of a syllogism before knowing the whole syllogism. Clearly we have to know what various words mean before we put them into propositions, and we have to know whether propositions are true before we can construct a sound argument out of them. Thus, in the given syllogism, we have to know what "snow" means and what "white" means—we have to be able to define the words—before we can determine whether the proposition is true or not. And then, before we can give a full syllogism, we must further know the structure of a proposition, and how to determine when a proposition is true. Finally, in giving the full syllogism, we have to know how to relate propositions to each other and infer a conclusion from them.

We can now see the extent of an elementary course in logic. There

are three main topics to be considered: (1) definition, (2) proposition, and (3) syllogism. Each of these belongs to a different act of the human intellect.

Definition is known by the act of simple apprehension. The act of simple apprehension is the way in which we grasp a simple object, such as man or dog or horse. This is the first act of the human intellect, and we express these simple notions by definitions. We must know such simple objects first before we can combine simple objects into the complex structure of a proposition. In short, we must know the definitions of dog and animal before we can combine them into the proposition *Every dog is an animal*.

The proposition (also called an enunciation) is known by the intellectual act of composition and division of terms, in which truth or falsity appears. If we combine or compose two terms, as in *Every dog is an animal*, we have an affirmative proposition. If we divide or deny two terms of each other, as in *No horses are dogs*, we have a negative proposition.

The syllogism is known by the act of reasoning, in which we proceed from one thing to another. More specifically, by knowing two propositions as true and as related in a certain way to each other, we reason to a third proposition concluding from them. Thus, by knowing *Every mammal is an animal* and *Every cow is a mammal*, we arrive at the reasoned knowledge *Every cow is an animal*.

Let us recall here that we originally spoke of logic as the art that guides us in coming to know the unknown. There are, actually, only two kinds of unknown objects: a simple object, such as man, and a complex object, such as artistic man. Let us relate these two kinds of unknown objects to the three acts of the intellect listed above.

As we have seen, a simple object is made known by the first act of the intellect, which we called simple apprehension. The principal means of knowing a simple object is by defining it. A sign that we know the simple object man is the definition that we give of man. Since the purpose of the first act of the intellect is to arrive at definitions, this act is guided by the part of logic that we call the art of defining.

A complex object is made known by means of argumentation. But argumentation requires two additional acts of the intellect: the act of composition or division and the act of reasoning. Hence, the second act of the intellect combines the simple objects that have been made known by the first act of the intellect in definition. It combines them by affirming one simple object of another; it divides them by denying one of the other. If such a combination or division is not self-evident, then it must be manifested by argumentation, and because

of this, a third act of the intellect is necessary. The third act is the reasoning process by which we proceed from propositions made known by the second act of the intellect to a conclusion following from these propositions.

From this discussion we can now give a definition of logic and the principal divisions of logic. *Logic is the art that directs the three acts of the intellect.* The division of logic can be outlined as follows:

<i>Object</i>	<i>Made Known By</i>	<i>Acts of the Intellect</i>	<i>Logic</i>
Simple	Definition	Simple Apprehension	(Part One)
Complex	Argumentation	[Composition or Division [Reasoning	(Part Two) (Part Three)

### FORMAL AND MATERIAL LOGIC

The division of logic into formal and material logic need not be considered to any great extent in a beginning course. The division is constantly presupposed in such a course, however, and we shall therefore examine it briefly.

In the broad meaning of the word, the form of logic is concerned with the order that reason puts into its acts of knowing. The acts of knowing (which we have listed above as simple apprehension, composition or division, and reasoning) constitute the matter of logic.

But when we talk about formal logic and material logic, we are using a narrower meaning of the words *form* and *matter*. In this narrower meaning, both formal and material logic refer to the order that reason puts into its acts of knowing. In so far as this order in the acts of knowing refers to the *manner of signifying*, we have formal logic. In so far as this order in the acts of knowing refers to the *things signified*, we have material logic.

Let us employ an example to bring out more concretely the traditional division of formal and material logic. We shall use the syllogism, in which the distinction is revealed most fully and clearly.

Formal logic deals with the manner of ordering terms and propositions in a syllogism. We can signify this in the following way:

Every B is C.  
Every A is B.  
Therefore, every A is C.

As we shall see later, this is a formally correct syllogism.

Now let us consider the syllogism in the following way:

Every animal is a living being.  
Every cow is an animal.  
Therefore, every cow is a living being.



This is also a formally correct syllogism. The use of words, however, brings out the matter of the syllogism, matter in the sense of the things signified, which material logic considers. But material logic does not consist in merely applying the form of logic; it considers certain determinations on the part of the things signified. Thus, sometimes the things signified—the logical matter—will give a *necessary* conclusion, as in the syllogism given on page xvii. At other times, however, the things signified will give only a *probable* conclusion, as in the following example:

Every mother loves her child.  
Susan is a mother.  
Therefore, Susan loves her child.

The determination of a syllogism as necessary, or the determination of a syllogism as probable, is made on the part of material logic, even though the syllogism remains the same formally.

From all this it follows that formal and material logic, as we now understand this division, are not to be regarded as two aspects of logic that can be totally isolated from each other. We cannot, for example, suppose that an introductory course in logic is only formal logic. Any course in logic must include both formal and material logic, although one aspect may be emphasized more than the other. A purely formal logic, then, is not possible.

Thus, in the syllogism that we have expressed formally above, the symbols, *A*, *B*, and *C* still imply matter, or things signified, to the extent that the symbol *A* has to be some object that can stand as the subject of the conclusion of the syllogism, the symbol *B* has to signify some object that can stand as the middle term of the syllogism, and the symbol *C* has to signify some object that can stand as the predicate of the conclusion. Furthermore, as we shall see later, the symbol *C* has to signify an object more universal than *B*, and *B* an object more universal than *A*.

Introductory logic, consequently, is not purely formal logic. It is both formal and material logic, since we cannot ignore either part altogether. We do, however, in some places emphasize formal logic and in other places material logic. Part One of the text is almost exclusively material logic, for in the first act of the intellect there is little order or arrangement in manner of signifying that we can introduce into a treatment of the simple object. Part Two, concerning the act of composition or division, and Part Three, concerning the act of reasoning, emphasize the formal part of logic in an introductory course.

*Part One*

## THE FIRST ACT OF THE INTELLECT



## Chapter One

### WORDS, CONCEPTS, AND SIGNS

X A /E shall begin with some general observations, drawn from  
\* ' psychology, on the way in which human beings know  
things. We shall summarize only the few points on human knowing  
necessary for logic.

Experience teaches us that we know in two distinct ways. As we mentioned in the Introduction, we know things through our senses, internal and external. We also know things through our intellect, and experience teaches us that our intellect attains something that our senses do not attain. By our senses we know the colors and sounds and the sizes and shapes of things; from our sense knowledge of things our intellect arrives at a knowledge of what those things are—the natures of the things. We do not sense the natures of things; we sense only material, singular characteristics of things. For example, we know by our senses the appearance of a person, his color, his size and his shape. We know intellectually the kind of person he is—that he is of honest character or that he is a prudent man.

We recognize also from experience that our intellectual knowledge is abstractive. We abstract when we make a separation. Intellectual abstraction, or separation, consists in leaving aside whatever is material and singular, retaining only the nature of the thing, as we abstract *man* from *James*. Whereas our sense knowing directs us to material, singular things (for example, the color of this man), our intellect directs us to the natures of these things, which, by abstraction, are known as universals (for example, the nature of man).

In sense knowing we have images; in intellectual knowing we have concepts. Through images we know material, singular things. Through concepts we know directly the universal nature of material, singular things. Indirectly, we can refer our concept to the singular thing known by the senses.

With these preliminary points about human knowing summarized

from psychology, we can now consider the role of words and concepts in logic.

#### NECESSITY OF CONSIDERING WORDS IN LOGIC

A word is an articulate sound that signifies a concept. As a physical object, a word is a material thing, which can be sensed, but its meaning, that is, what the word signifies, is intellectual. Words thus stand for things or objects as they are conceived by the intellect. Consequently, a word such as "man" stands for the concept that I have of a human being. We speak words or write words to express the concepts that we have of various things.

It is necessary, therefore, that logic consider words, since without words we could not express the things we conceive. Logic, of course, is primarily concerned with things as they are conceived by the intellect. But since we express our concepts most perfectly by words, logic must also make use of words as instruments for expressing and communicating concepts.

#### THE RELATION BETWEEN WORDS AND CONCEPTS

Since words and concepts are sometimes confused, the following relation of words and concepts will help to keep them distinct:

One word can mean, or signify, one concept. "Man" signifies the concept of a human being.

One word, by equivocation, can signify two diverse concepts. The word "bark" can signify the concept of the sound that dogs make through their mouths. "Bark" can also signify the outer covering of a tree.

Two words can signify one and the same concept. The word "God" in English signifies the concept of a supreme being. The word "Dieu" in French signifies the same concept of a supreme being.

Let us notice, then, the precise importance of words, without either exaggerating or diminishing their role in human knowledge and communication. Their importance is found primarily in the function they have of expressing and communicating our concepts. We should not exaggerate their importance by equating, and even identifying, them with concepts, thereby forgetting that their purpose is to express our conceptions. We should not diminish their importance by supposing that we can somehow get along without them.

It is true that words cannot achieve the perfection in signifying that our concepts have. We frequently experience this situation when we say that we are at a loss for words to express what we mean. Words have a necessary limitation in their signification because they are

sensible, physical things restricted in the manner in which they signify. Concepts are not restricted in this way because of their immaterial mode of existence in our minds.

There is, therefore, necessarily some gap between a material means of signifying, as with words, and an immaterial means of signifying, as with concepts. Because of this incommensurability between words and concepts, words cannot adequately or perfectly signify concepts. Words, in fact, *arbitrarily* signify concepts. The word "man," for example, has no necessary connection with the concept we have of a human being. The word "anthropos" could just as well signify the concept as indeed it does in Greek.

### SIGNS

We referred to signification when we distinguished between words and concepts. Let us consider signification and signs more specifically, so that we can understand better what kind of sign a word is and what kind of sign a concept is. There is an additional reason for considering signs. A good deal of attention has been given in recent years to the analysis of signs, usually referred to as *semantics*, the study of signs. It would be a matter of ignorance, however, to suppose that an analysis of signs is only a modern development. Treatises on signification stretch back to St. Augustine, Aristotle, and Plato. The importance of semantics is thus indicated by the attention given it in both ancient and modern times. We shall, then, summarize some of the main points on signification.

### THE DEFINITION OF A SIGN

A sign is that which represents something other than itself to a knowing power.

This definition indicates that we explain signs in terms of knowing. How we know, therefore, is more fundamental than how we use signs. Any attempt, consequently, to establish a sound semantics without a sound analyses of knowing is certain to be inadequate, if not false. We cannot give an adequate account of signification without distinguishing the two basic kinds of knowing in man, sense knowing and intellectual knowing. We must keep the role that the image plays in sense knowing distinct from the role that the concept plays in intellectual knowing.

The definition also reveals the elements of signification: the *sign* (that which represents), the *thing signified* (something other than itself), and the *knowing power*. Any sign, then, has to depend both upon the thing it signifies, that is, what it refers to, and upon the knowing

power (sense and intellectual) that uses the sign. A road sign is an obvious illustration of these elements. The sign itself is expressed in words: *thirty miles per hour*. The thing signified is the speed limit. The knowing power is both the sense power of vision, by which the sign is seen, and the intellectual power of thinking, by which the words of the sign are understood. All signification contains these three distinct elements.

### THE DIVISIONS OF A SIGN

From the discussion of the definition of a sign, we can now see that a sign may be divided in two ways. On the one hand, a sign is related to the knowing power, and upon this basis we make one division. On the other hand, a sign is related to the thing signified, and upon this basis we make the other division.

#### 1. *As the sign is related to the knowing power*

(a) *Formal sign*. The formal sign is a sign that functions as a means of knowing. We therefore speak of a formal sign as an intentional form, a form through which an object is represented to our knowing power. Since we have two kinds of knowing powers, sense and intellectual, there is a formal sign through which we know things by sense, the image, and a formal sign through which we know things by the intellect, the concept. There are, consequently, only two formal signs: the image and the concept. They are the interior signs of knowing that we have.

(&) *Instrumental sign*. The instrumental sign is an object first known in itself, unlike the formal sign, which is a pure means of knowing. The instrumental sign is a sign which must be known first as an object before we can know that it represents something else. For example, the red light of a traffic signal, an instrumental sign, must be first seen and known as an object before we can know what it signifies, namely, to stop.

The distinction between formal and instrumental signs is a very important one. Unfortunately, it is a distinction that is often ignored or confused. The instrumental sign is usually recognized because it is so obvious, but the formal sign, not being immediately apparent, is frequently overlooked. The formal sign is interior to the knowing-power, and for this reason is less familiar and less obvious than the instrumental sign, which is exterior to the knowing power. The formal sign might be compared to a pair of glasses through which we see, but of which we are not usually aware, although we are seeing by means of

them. The instrumental sign, for example, an arrow, must be known first as an object before it functions as a sign.

This distinction between the formal and the instrumental sign helps us to see the distinction between concepts and words. All words are instrumental signs, for we must first know the word before we know the meaning of the word. All concepts are formal signs, leading us directly to the knowledge of things themselves. By understanding concepts as formal signs, we see that concepts are never the objects of our intellectual knowing, except indirectly, but only the means by which we know things. Now, just as all instrumental signs presuppose formal signs (for we cannot know any instrumental sign, such as an arrow, except through an image, which is a formal sign), so all words, as instrumental signs, depend upon concepts, as formal signs, for their meaning or significance.

An important consequence follows from this. We have just seen that words must depend upon concepts for their meaning; words therefore cannot immediately and directly signify things. The word "dog" does not directly signify a real animal; it signifies directly both the image and concept we have of a real animal.

This first division of the sign gives us only two kinds of sign, formal and instrumental. All signs, however, can be classified within this division. We shall now go on to the second division of the sign, under which all signs can be classified again, but in a different way.

## 2. *As the sign is related to the thing signified*

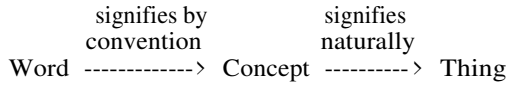
( $\alpha$ ) *Natural sign.* A sign is called "natural" because there is a natural relation between the sign and the thing it signifies. A natural sign is causally related to the thing it signifies. Hence a natural sign has the same signification for all men. For example, smoke is a natural sign of fire.

( $\&$ ) *Conventional sign.* A sign is called "conventional" when the relation between the sign and the thing signified is made deliberately and arbitrarily by the human will. The conventional sign, because it signifies arbitrarily, requires agreement as to what it is to represent, this agreement usually being sanctioned by legal or social authority. The traffic light is an example of a conventional sign.

A word is a conventional sign, with the dictionary as the authority for the imposition of a given meaning. As we have seen, a word arbitrarily (that is, conventionally) signifies a concept; a concept, however, naturally signifies a thing. We thus have another way of distinguishing words from concepts: words are conventional signs and



concepts are natural signs. Thus, the word “tree” conventionally signifies the concept that is a natural sign of a certain kind of plant. We can illustrate this by the following diagram:



(c) *Customary sign.* A sign is called “customary” when the relation between the sign and the thing known is made by association through tradition or custom. The customary sign is a kind of mean between the natural sign and the conventional sign, and for this reason it is sometimes difficult to distinguish the customary sign from the other two kinds. Like a natural sign, a customary sign may have some natural basis for the signification. But the basis for the signification will not be purely natural, and hence, like the conventional sign, the customary sign has also a voluntary basis for the signification. As the word “customary” suggests, the distinctive characteristic of the customary sign is the custom or tradition underlying the signification, as, for example, in religious signs and symbols. The tipping of a hat is a customary sign of courtesy shown to people.

#### QUESTIONS—CHAPTER ONE

1. What are the two distinct kinds of human knowing? Illustrate with examples drawn from experience.
2. What is the meaning of the statement that our intellectual knowledge is abstractive?
3. Why does logic consider words? Are words the primary concern of logic?
4. Specify the different ways in which words and concepts are related. Use original examples.
5. In what does the importance of words consist?
6. Why is there an incommensurability between words, or any written and spoken symbols, and concepts?
7. What does “semantics” mean?
8. Give the definition of a sign.
9. What are the elements of signification?
10. Upon what basis is the first division of a sign made? Upon what basis is the second division made?
11. Distinguish between a formal sign and an instrumental sign.
12. Explain the distinction between words and concepts in terms of formal and instrumental signs.
13. Must a word always directly signify a concept? Explain.
14. What is a natural sign? Give five examples.
15. What is a conventional sign? Give five examples.
16. What is a customary sign? Give five examples.

EXERCISE—CHAPTER ONE

Classify the following signs as *natural*, *conventional*, or *customary*:

- 1- Thunder as a sign of a storm.
2. A cross as a sign of Christianity.
3. The word “horse” as a sign of the concept of a certain animal.
4. A ruler as a sign of a measure of length.
5. The concept of flower as a sign of a certain kind of plant.
6. A ring as a sign of marriage.
7. Bowing as a sign of respect.
8. Footprints as a sign of a living being.
9. A clock as a sign of time.
10. A number as a sign of quantity.
11. Flowers as a sign of love.
12. A frown as a sign of irritation.
13. The blowing of a whistle as a sign of a foul in a game.
14. Complexion as a sign of health.
15. A copyright as a sign of ownership.
16. Shaking hands as a sign of friendship.
17. Fever as a sign of illness.
18. A question mark as a sign of a question.
19. Frost as a sign of cold weather.
20. 32° Fahrenheit as a sign of freezing.



## *Chapter Two*

### *THE PREDICABLES*

**W**E have just finished considering words and concepts, their place and role in logic, the distinction between them, and their relation to each other. The treatment of words and concepts is a natural beginning for the logic of the first act of the intellect, since logic aims to order our concepts as they are expressed by words. We have also considered signs, for the notion of signification helps to clarify the distinction between words and concepts.

Now the logic of the first act of the intellect is concerned with a simple object, such as man or dog. This first part of logic is ordered primarily to definition, since we know a simple object completely when we can define it. To define an object, we must be able to say something about that object. To say something about an object is to predicate something of it. The predicables, then, are simply the different ways in which we can say something about an object. For example, we can say “animal” of dog, and “brown” of dog.

We need to know what the predicables are so that we shall be able to make good definitions. A predicable, however, is included under the notion of the universal, and, therefore, to understand what a predicable is, we shall consider the universal first.

#### **THE UNIVERSAL**

The general meaning of “universal” is something common to many things. For example, we speak of universal suffrage, meaning the participation of many in the right to vote. We speak of universal military training. We speak of the generosity of Americans, in the sense of a trait found universally in Americans. In this broad meaning, universal is taken as opposed to the singular, which is restricted to only one thing.

We use words both as universal and singular. The word “man,”

for example, signifies our concept of human nature as it is common to all individual men. We get this universal notion of man by abstracting it from the individual men in which it is found. The word "Paul," on the other hand, expresses something singular—the word "Paul" is proper to an individual. (It does not matter that many individuals might be named "Paul." In each instance "Paul" expresses something singular, and we add middle and last names to bring out the individuality.) We express the equivalent of the distinction between the universal and the singular in grammar by speaking of common nouns and proper nouns.

Now when we speak of the predicables as universals we are using a restricted meaning of the word "universal." The "universal" we are going to consider now is a nature as it can be found in many individuals. The mind sees that a nature can be found in many and the mind then forms the *relation* of one nature to many individuals—the relation of universality. This kind of universal is called the *logical* universal. The logical universal, therefore, is a relation made by our mind and added to the nature which we have abstracted from singulars.

Let us consider this matter again in the following way. As we have seen, we abstract a nature from its singulars or inferiors. For example, we abstract the nature of man from individual men. To this nature as abstracted we can add explicitly the relation this nature has to the inferiors under it. This relation of a nature to its inferiors is a logical universal. The relation of the nature of man to the individuals included under it is the relation of species. Species is one of the predicables, for in virtue of this relation of man to individual men we can predicate man of individual men. All predicables follow from the relation of a nature to its inferiors.

#### NOTION AND DIVISION OF PREDICABLE

We shall now consider the predicables directly and in detail. The predicables are the ways in which a universal can be said of its inferiors, that is, the kinds of connection there can be between a universal and the inferiors or subjects in which it is found.

There are five predicables. We shall see that there are five by considering the predicables according to the essential and accidental connections that the logical universal has with its inferiors. An essential connection occurs when the universal is intrinsic to the nature of its inferiors. For example, the universal *animal* is of the very nature of dog, and therefore intrinsic to dog. An accidental connection occurs when a universal is extrinsic to the nature of its inferiors. For example, color is something extrinsic to the nature of dog.

*The kinds of essential connection*

1. *Genus*. Genus is the universal that can be said of many that differ specifically. It answers the question *What is it?* However, the predicable genus answers this question incompletely, because the genus expresses only part of the essence or nature. For example, "animal" is a genus when said of man and dog. It expresses only part of the essence of man or of dog.

2. *Species*. Species is the universal said of many that differ in number. It also answers the question *What is it?* But the predicable species answers this question completely; that is to say, it expresses the whole essence. For example, "man" is a species when said of Paul or James or John.

3. *Difference*. Difference is the universal said of many that differ even in species. It answers the question *Of what quality is the essence?* The predicable difference distinguishes one species from another within the same genus. Thus, if we ask of what quality man's essence is, to distinguish man from any other species in the genus of animal, we answer "rational," and by this we designate the specific difference.

*The kinds of accidental connection*

1. *Property*. Property is the universal said of a species as that which belongs only, necessarily, and always to that species and to every individual of that species. A property is convertible or interchangeable with the species of which it is a property. For example, "grammatical" is said of man as a property. We can convert the property with the species by saying that wherever there is a man there is the property of being grammatical, and wherever there is a grammatical being there is a man.

Property is sometimes understood in a looser sense when it is used to designate merely that which belongs to a species always, but does not belong only to it. In logic we use property in the strict sense, as we have defined it above.

2. *Accident*. Accident is the universal said of a species as that which belongs contingently to that species and to the individuals of that species. An accident is a characteristic that can come to be or disappear without destruction of the species in which it is found. For example, "white" is said of man as an accident. The color white does not necessarily characterize man, nor is it found always in man, nor does it belong only to man.

As we shall see later, definitions are stated in terms of these predicables.

**QUESTIONS---CHAPTER TWO**

1. What is the general meaning of “universal”? Give an original example of something universal in this sense.
2. What is a logical universal?
3. What is the common notion of the predicables?
4. What predicables have an essential connection? Define each of them and give an original example of each.
5. What predicables have an accidental connection? Define each of them and give an original example of each.
6. Why are the predicables studied in logic?

EXERCISE-CHAPTER TWO

State which predicable the *second* word expresses in relation to the first.

- 1. Robin—bird
- 2. Man—artistic
- 3. Paul—man
- 4. James—white
- 5. Snow—white
- 6. Logic—art
- 7. Man—rational
- 8. Horse—brown
- 9. Justice—virtue
- 10. Man—biped
- 11. Fido—dog
- 12. Flower—red
- 13. Lily—flower
- 14. Blue—color
- 15. Brute—irrational
- 16. Man—tool-making
- 17. Cow—animal
- 18. Swan—white
- 19. Elephant—heavy
- 20. Tree—plant





## Chapter Three

### *DISTINCTIONS* PRELIMINARY TO

#### ) THE CATEGORIES

THE categories, which we shall consider in the next chapter, are the most universal genera under which all things can be ordered. However, before we can treat the categories we must consider certain distinctions which we need in order to understand the categories. These preliminary distinctions are traditionally called the “antepredicaments.” “Predicaments” is another name for the categories. The antepredicaments therefore designate certain distinctions and considerations which have to be taken up in advance of the predicaments, or categories.

We shall consider three distinctions which serve as conditions needed for determining the categories.

#### I. UNIVOCAL, EQUIVOCAL, AND ANALOGOUS NAMES

A *univocal* name or word is one that is imposed on many things and signifies the same nature in each. For example, the name “man” signifies all individual men in so far as each one has the same human nature, and hence all agree in the same meaning of man. Thus, “man” is said univocally of Paul, James, John, and so forth. Likewise, the name “animal” is said univocally of horses, dogs, lions, and so forth, each of which has the same nature, signified by the word “animal.”

An *equivocal* name is one that signifies different natures. The name is common but the natures which it signifies are totally distinct. Thus, the word “bow” is common to and is said of a weapon and a knot, but a weapon and a knot are totally distinct things.

An *analogous* name is one that signifies different natures but is imposed primarily on one nature and secondarily on others with reference to the first. An analogous name is proportionately one, because, al-

though it is said of distinct natures, it is said with reference to the nature it primarily signifies. For example, "healthy" is said primarily of a man or an animal who is healthy, and secondarily of food, which preserves health, of medicine, which causes health, and of blood, which is a sign of health.

Sometimes there is difficulty in distinguishing between equivocal and analogous names. It may be of help to note that when a name is equivocal, there is only an accidental and arbitrary connection between the two natures which are signified. But when it is analogous, the name has been imposed deliberately upon the distinct things to show some relation or likeness among them, in such a way that the name refers primarily to one and secondarily to the others. The secondary meanings exist only because of the primary meaning, just as food cannot be understood to be healthy except in relation to a man or an animal, where health is found primarily. Hence the things signified secondarily are defined in relation to the thing signified primarily.

In relation to the categories, the distinction of univocal, equivocal, and analogous names is important because only names signifying univocally are used in the categories.

## II. COMPLEX AND INCOMPLEX EXPRESSIONS

A complex expression, which signifies a complex thing, is that which has two or more natures present at once. "Brown animal" is a complex expression since it signifies both the essence of brown and the essence of animal.

An incomplex or simple expression, which signifies a simple thing, is that which has only one nature, as in "dog," "color," "quantity," and "science."

In relation to the categories, this distinction is important because only incomplex expressions, signifying simple things, can be placed in the categories. Complex things belong in more than one category,

## III. EXISTENCE IN A SUBJECT AND PREDICABLE OF A SUBJECT

The words "existence in a subject" signify *inherence* in a subject. This is the kind of existence an accident has. An accident is that which exists in a subject, that is, in a substance. A substance is that which exists in itself. Thus, color is an accident because it exists in a subject or substance.

The words "predicable of a subject" signify something that can be said or predicated of a subject. Thus, "animal" is predicable of "dog."

As we have seen in the preceding chapter, only something universal is predicable of a subject.

Now, we can relate “existence in a subject” and “predicable of a subject” to each other in various ways. For example, what is it that both exists in a subject and is predicable of a subject? It is a *universal accident*, for to exist in a subject is to be an accident, and to be predicable of a subject is to be universal. Whiteness is an example of a universal accident, for it exists in a subject (in a substance, such as man) and is also predicable of that subject.

On the other hand, what is it that does not exist in a subject and is not predicable of a subject? It is a *singular substance*, for that which does not exist in a subject is a substance, and that which is not predicable of a subject is singular. Paul is an example of a singular substance, for he exists in himself and not in some other subject, and “Paul” cannot be predicated of something else.

There are still two other relations we can make. What is it that does exist in a subject but is not predicable of a subject? It is a *singular accident*, for that which does exist in a subject is an accident, and that which is not predicable of a subject is singular. The individual height of Paul is a singular accident. On the other hand, what is it that does not exist in a subject but is predicable of a subject? It is a *universal substance*, for that which does not exist in a subject is a substance, and that which is predicable of a subject is universal. Man is an example of a universal substance, for man does not exist in a subject, but can be predicated of a subject—for example, of “Paul.”

Let us summarize these relations in the following order:

*Singular substance*: It does not exist in a subject and is not predicable of a subject.

*Universal substance*: It does not exist in a subject and is predicable of a subject.

*Singular accident*: It exists in a subject and is not predicable of a subject.

*Universal accident*: It exists in a subject and is predicable of a subject.

With respect to the categories, these four relations help us to see the difference between substance and accident, for the categories are made up of substance and accidents. Likewise, the distinction is drawn between singular substance and universal substance, also known as first substance and second substance. Finally, the distinction is made between singular accident and universal accident.

**QUESTIONS--- CHAPTER THREE**

1. Explain univocal, equivocal, and analogous names. Give original examples of each.
2. What is the difference between an equivocal name and an analogous name?
3. What does “existence in a subject” mean?
4. What does “predicable of a subject” mean?
5. Distinguish between singular substance and universal substance.

EXERCISE—CHAPTER THREE

Classify the following words as univocal, equivocal, or analogous.

1. *Student* as signifying senior and freshman.
2. *Father* as signifying God and man.
3. *Blue* as signifying the color of sky and of water.
4. *Talking* as signifying the vocal sounds of man and parrot.
5. *Body* as signifying horse or cow.
6. *Flower* as signifying tulip and rose.
7. *Key* as signifying an instrument to open a lock and tonality of scale.
8. *Science* as signifying ethics and politics.
9. *Religious* as signifying man and music.
10. *Bat* as signifying an animal and a club.
11. *Plant* as signifying a flower and a tree.
12. *Color* as signifying red and blue.
13. *Sound* as signifying a noise and a long channel of water.
14. *Sickly* as signifying an ailing condition and a kind of complexion.
15. *Pen* as signifying a writing instrument and a small enclosure.
16. *Animal* as signifying a horse and a dog.
17. *Race* as signifying a contest and a certain kind of people.
18. *Violet* as signifying a flower and a color.
19. *Publication* as signifying a book and a magazine.
20. *Poor* as signifying lack of riches and bad health.



## *Chapter Four*

# THE CATEGORIES

THE natures of all things can be ordered according to greater or lesser universality. They can also be placed in genera that have no genera above them. These ultimate genera are the categories.

Let us first distinguish between the predicables and the categories. In the chapter on the predicables we treated the relationship of a nature to its inferiors, which is the logical universal, and we divided this logical universal into the five predicables. But the logical universal presupposes the nature as abstracted from individuals, and it is this nature we treat when considering the categories. We are, then, concerned with the real natures of individual things in the categories.

But in logic—as distinct from the treatment of the categories in metaphysics—we are concerned with real natures only in so far as they are capable of orderly arrangement in the categories. The logical consideration of the categories reduces to this: For any given nature we ask what its supreme univocal predicate is, that is to say, what its supreme genus is. For example, what is the supreme univocal predicate of man? In what supreme genus is man? The supreme univocal predicate of man is, as we shall see, substance. Man, therefore, is in the category of substance. Color, however, has not the supreme univocal predicate of substance, for we cannot say that color is a substance. It will, therefore, be in some other category.

Hence, in logic, we order all things under their supreme genera. Within each supreme genus, we then order all things according to greater or lesser universality. The categories, therefore, are simply the ordering of all things as genera and species under supreme genera.

Why do we study the categories in logic? There are two principal reasons. One reason is that the study of the categories gives us an orderly grasp of all things. The other reason is that a knowledge of the categories is useful for definition. Knowing the ultimate genus



to which a thing belongs is the first step in coming to know the proximate genus, which, as we shall see, is necessary for the definition of a thing.

Certain conditions have to be observed in determining the categories:

(1) Only real natures belong in the categories; artificial things are excluded. Furthermore, the categories are not divisions or classifications of words.

(2) Whatever is in a category must be a simple thing. It must be something whose nature is one.

(3) Whatever is in a category must be signified by a univocal name.

(4) The physical or entitative parts of a thing belong in the category in which the whole thing or nature belongs. For example, the soul, as an entitative part of man, belongs reductively in the category of substance since man belongs in the category of substance.

### THE TEN CATEGORIES

With these preliminary considerations finished, we shall now list the ten categories, the ten ultimate predicates that can be said of all things, giving a brief explanation of each category, with examples.

#### 1. *Substance*

The primary meaning of substance is that it neither exists in a subject nor is predicable of a subject. This meaning of substance, as we have seen, applies to first substance. The *category* of substance, however, concerns second substance—universal substance—because the categories are supreme universals or ultimate genera of all things. Examples of substance, then, are: dog, man, tree.

#### 2. *Quantity*

Quantity is an accident that makes a substance divisible into constituent parts. Quantity exists in a substance in so far as a substance is material. Quantity is either *discrete*, as in numbers: ten, twenty, thirty (from which arises the science of arithmetic); or *continuous*, as in line, surface, plane (from which arises the science of geometry).

#### 3. *Quality*

Quality is an accident that gives a substance a certain attribute. For example, whiteness is the quality in virtue of which a substance is called white. There are four species of quality.

(«) *Habit and disposition.* A habit is a quality by which a substance is well or ill disposed. A habit is a firmly established quality, for example, science or a moral virtue. A disposition is a quality easily changed, as opinion.

(?) *Potency or impotency.* Potency is the quality that is a proximate principle of operation. It disposes a substance for operation, as healthiness, firmness. Impotency is a weak and imperfect form of potency, as nearsightedness, feeble-mindedness.

(c) *Sense qualities.* These are the qualities which affect the senses, as sweetness, whiteness.

(d) *Figure and form.* Figure is the quality that terminates quantity, as straightness, triangularity, curvedness. Form (shape) adds a certain proportion and beauty to the termination of quantity, which is manifested especially in artificial things, as in the form of a statue.

#### 4. *Relation*

Relation is an accident existing in a subject resulting from its reference to something else, as superiority, smallness, maternity.

#### 5. *Action*

Action is an accident resulting from the subject's acting upon something else, as throwing, striking, making.

#### 6. *Passion*

Passion is an accident resulting from the subject's being acted upon, as being thrown, being struck, being made.

#### 7. *When*

The "when" of a thing is an accident existing in a subject resulting from the subject's being measured by time, as yesterday, Monday, year.

#### 8. *Where*

The "where" of a thing is an accident existing in a subject resulting from the subject's being in a certain place, as here, in the room, in Europe.

#### 9. *Position*

Position or posture is an accident existing in a subject resulting from the subject's having an order of parts in place, as kneeling, sitting, reclining.

10. *Habit*

Habit (as distinct from the habit which is a species of quality) is an accident resulting from the subject's wearing clothes or ornaments, or having weapons, as the state of being robed, armed, or shod.

Notice that every category except substance is an accident. The categories, then, are made up of substance and nine accidents. We are speaking here of *predicamental* (categorical) accident, as distinct from *predicable* accident, which we treated in Chapter Two.

The predicable accident refers to the logical universal that is said of its inferiors contingently, as "white" is said of dog. The predicable accident is therefore opposed to genus, species, difference, and property.

The predicamental accident signifies that mode of existence which is to inhere in another. A quality, for example, is a predicamental accident because its mode of existence is to exist in a substance. Predicamental accident, therefore, is opposed to substance.

The question might be raised as to why there are ten categories. We shall give a brief answer to this question here. The number of the categories is determined by the diverse ways of predicating, for each category is the most universal predicate in its genus. We can summarize this in outline form.

- A. A predicate can be said of a subject as pertaining to the essence of the subject. Such a predicate is in the category of substance. Thus, when I say "Paul is man," I signify *man* as second substance, which pertains to the essence of Paul.
- B. A predicate can be said of a subject as it exists in the subject:
  1. On the part of matter. We then have the category of quantity, as in "Paul weighs two hundred pounds." Two hundred pounds is a quantity.
  2. On the part of form. We then have the category of quality, as in "Paul is studious." Studiousness is a quality.
  3. As referring the subject to something else. We then have the category of relation, as in "Paul is superior." Superiority is a relation.
- C. A predicate can be said of a subject as signifying movement in relation to something outside the subject:
  1. When the subject is the principle of movement. We then have the category of action, as in "Paul is hitting." Hitting is an action.
  2. When the subject is the term of movement. We then have the

category of passion, as in "Paul is being hit." Being hit is a passion, or is passive.

D. A predicate can be said of a subject as signifying something taken from outside the subject:

1. As the predicate signifies an extrinsic measure of the subject:

(z) When the predicate is taken on the part of time. We then have the category of when, as in "Paul arrives today." "To-day" signifies when.

(&) When the predicate is taken on the part of place:

(1) As the predicate signifies place simply. We then have the category of where, as in "Paul is in Europe." "In Europe" signifies where.

(2) As the predicate signifies the order of parts in place. We then have the category of position, as in "Paul is kneeling." Kneeling is a position.

2. As the predicate does not signify a measure of the subject. The predicate then signifies the mode of habit in the subject. We then have the category of habit, as in "Paul is wearing a robe." "Wearing a robe" signifies the condition of being clothed. This is habit in the sense we mean when we speak of a riding habit.

#### MODES FOLLOWING UPON THE CATEGORIES

We shall add here two modes which follow upon all or most of the categories. These modes are also known as the postpredicaments, or certain characteristics which follow upon the predicaments or categories generally.

##### 1. *Opposition*

Opposition arises from the distinction and ordering of natures within the categories. There are four kinds of opposition.

(a) *Contradictory opposition.* Contradictory opposition is the fundamental kind of opposition. Strictly it is an opposition between being and non-being. The notion of contradictory opposition also extends to the total opposition of any two things as expressed by one positive name and its corresponding negative, as in *man* and *non-man*.

(&) *Privative opposition.* Privative opposition is the opposition between the form and the lack of the form in a subject that is capable of possessing the form. For example, *sight* and *blindness* is a privative opposition with reference to man as a subject.

(c) *Contrary opposition.* Contrary opposition is an opposition between two positive things which are extremes of difference within one and the same genus, each of which excludes the other from the same

subject. Contrary opposition in which no mean can be found is immediate, as in *odd* and *even*. Contrary opposition in which there is a mean is mediate, as in *black* and *white*, *good* and *bad*.

(d) *Relative opposition*. Relative opposition is an opposition between things which mutually refer to each other, as in *double* and *half*, *father* and *son*.

## 2. *Priority*

Priority means some kind of precedence of one thing over another. The various kinds of priority can be reduced to two.

(a) *Priority of time*. This is the kind of priority we usually think of when we speak of one thing as prior to another. Priority of time is priority in duration or in existence. Thus, youth is prior to adulthood.

(b) *Priority of nature*. Priority of nature is a priority in causality. Priority of nature must be distinguished carefully from priority of time. The priority of a cause to an effect need not involve priority of time. For example, my hand moving a book is a causal relation. My hand moving a book has a priority of nature over the book as moved, but not a priority of time. The movement is simultaneous. Priority of nature is a priority of perfection.

## QUESTIONS----CHAPTER FOUR

1. What is the difference between the predicables and the categories?
2. In what does the logical consideration of the categories consist?
3. Why are the categories studied in logic?
4. What conditions have to be observed in determining the categories?
5. Why are there ten categories?
6. Explain each category, and give original examples.
7. What is the difference between predicable accident and predicamental accident?
8. What is the most fundamental kind of opposition? Why is it the most fundamental?
9. What is the difference between privative opposition and contrary opposition?
10. What is the difference between priority of time and priority of nature?

# EXERCISE I—CHAPTER FOUR

In which category does each of the following belong?

- |                             |                                 |
|-----------------------------|---------------------------------|
| _____ 1. Turnip             | _____ 21. Lameness              |
| _____ 2. At noon            | _____ 22. Mathematics           |
| _____ 3. Philosophy         | _____ 23. Drinking              |
| _____ 4. Inequality         | _____ 24. Priority              |
| _____ 5. Granite            | _____ 25. Nineteen              |
| _____ 6. At home            | _____ 26. Wearing a uniform     |
| _____ 7. Inability to spell | _____ 27. Flower                |
| _____ 8. Wearing a mask     | _____ 28. In the cell           |
| _____ 9. Jumping            | _____ 29. Dentistry             |
| _____ 10. Parenthood        | _____ 30. Leaning               |
| _____ 11. Lying down        | _____ 31. Stickiness            |
| _____ 12. Laying down       | _____ 32. Dancing               |
| _____ 13. Being laid down   | _____ 33. In the morning        |
| _____ 14. At once           | _____ 34. Minority              |
| _____ 15. Courage           | _____ 35. Upright               |
| _____ 16. Quart             | _____ 36. Inferiority           |
| _____ 17. Deafness          | _____ 37. Grasshopper           |
| _____ i_ 18. Triangularity  | _____ 38. On the chair          |
| _____ 19. Mineral           | _____ 39. Equality              |
| _____ 20. Surface           | _____ 40. Being put on the spot |



EXERCISE II—CHAPTER FOUR

State the kind of opposition that the following pairs of words signify.

- |         |                               |
|---------|-------------------------------|
| _____   | 1. Human—non-human            |
| .....   | 2. Human—inhuman              |
| _____   | 3. Mother—daughter            |
| -----   | 4. True—false                 |
|         | 5. Christian—non-Christian    |
| _____   | 6. Rich—poor                  |
| _____ - | 7. Whole—part                 |
| _____   | 8. Wit—witless                |
| _____   | 9. Logical—illogical          |
| _____   | 10. Teacher—student           |
| _____   | 11. Healthy—sick              |
| _____   | 12. Veteran—non-veteran       |
| -----   | 13. Odd—even                  |
| _____   | 14. Success—failure           |
| -----   | 15. Priority—posteriority     |
| _____   | 16. Life—death                |
| _____   | 17. Whole—half                |
| ----- - | 18. Being—non-being           |
| _____   | 19. Good—bad                  |
| -----   | 20. Considerate—inconsiderate |





## Chapter Five

# Division

■psIVISION is the distribution of a thing into its parts.

3^A division is a means of knowing a thing, for when we divide a thing into its parts we know better and more distinctly the thing that we are dividing. For example, by dividing *sign* into natural, conventional, and customary we know more about the sign itself through knowing its dividing members. Division as a mode of knowing can be seen most evidently in outlining, which is simply an adaptation of division. If we can outline a topic well, we can be sure of knowing it well. Outlining is therefore a valuable tool of learning, for by means of it we can reduce a book or a lecture to a summary of the main points in a logical order.

The immediate purpose of division is for the sake of making a good definition, which will be treated in the next chapter. The art of dividing is necessary for definition because, by dividing a genus into its species, we arrive at a knowledge of the species, and it is of a species or a nature that we give a definition.

### THE RULES OF DIVISION

The rules of division tell us how to make a good division:

1. *The dividing parts must be inferior, that is, less universal than that which is divided.*

Obviously, if we are dividing a thing, each dividing member will have to be less than what we are dividing. The thing we are dividing will have to be universal (a division of a singular thing would be physical division, not logical division). The dividing members, consequently, will have to be less universal. The dividing members could not be singulars, for singulars are the result of an enumeration, not a division.

For example, we can divide *tree* into *oak*, *elm*, *maple*, and so forth. *Tree*, as related to *oak*, *elm*, *maple* is more universal and therefore stands as a genus in relation to the different kinds of tree, which are species of tree.

2. *The dividing parts must exhaust or adequately divide a genus.*

In Chapter Two, we divided *predicable* into *genus*, *species*, *difference*, *property*, and *accident*. This is an exhaustive division, for there are no other possible kinds of connection between a predicate and a subject. If we divided *predicable* only into *genus* and *species*, we should not have an exhaustive division of *predicable*.

A corollary of this rule is that a division must have at least two dividing parts, for there must be at least two parts to a whole. It would be a contradiction to have a division with only one dividing-part.

3. *The dividing parts must be formally opposed to each other such that each part excludes the other.*

We examined the different kinds of opposition in the preceding chapter. We can use any of the four kinds of opposition in making a division. We can make a division by contradictory opposition by dividing *religion* into *Christian* and *non-Christian*. Division by contradictory opposition is the most certain and the easiest form of division. It is a sure and simple way of securing an exhaustive division, since only two dividing members are possible. In some cases, however, it is not a very revealing division.

By privative opposition, we can divide *man* into *sane* and *insane*, the latter signifying the lack of a certain perfection that man ought to have. By contrary opposition, we can divide *number* into *odd* and *even*. In distinguishing between privative opposition and contrary opposition, notice that privative opposition always includes the signification of something absent that should be present whereas contrary opposition always signifies an opposition between two positive things standing as the extremes within a genus.

Division by relative opposition may be either into parts that mutually refer to each other, as the division of *family* into *parents* and *children*, or into parts that merely specify formal differences within a genus, as the division of *flower* into *rose*, *tulip*, *lily*, and so forth.

4. *One and the same basis must be kept throughout a division.*

The basis of division is the foundation or point of view taken in making the division. For example, we can divide *man* into *Spanish*, *French*, *German*, and so forth, with nationality as the basis of division.

So long as we are dividing man according to that basis, we must not change it. If, while making that division, we included *white* or *black*, we should be shifting the basis of division from nationality to color.

However, nothing prevents our dividing something exhaustively according to one basis, and then dividing the same thing exhaustively according to another basis. This is called *co-division*, and consists in taking successive bases of division of the same thing. For example, in Chapter One we gave a co-division of the sign. We first divided the sign on the basis of the relation of the sign to the knowing power and so obtained the dividing parts of formal and instrumental. We then divided the sign according to a different basis of division, namely the relation of the sign to the thing signified, and so obtained the dividing parts of natural, conventional, and customary. It is not necessary to state explicitly the basis of a division, as we did when dividing the sign; the dividing parts themselves usually reveal the basis of division.

*Subdivision* is distinct from both division and co-division. Subdivision is simply a division made under another division, or a subordinate division. Thus, we can divide all things into the ten categories, as we did in the preceding chapter. We can then subdivide within each category. In a subdivision, the same basis of division as is in the main division may be kept, or a different basis of division may be taken.

## THE KINDS OF DIVISION

### 1. *Division of a universal whole into its subjective parts*

This is a division in which the whole, or that which is being divided, can be predicated of each of its parts. It is the division most properly of a genus into its species. For example, we divide *animal* into *man* and *brute*. *Man* and *brute* are the species of *animal*, and *animal* can be predicated of *man* and *brute*. This kind of division is the principal kind. In it, a genus is divided into its species by true differences.

### 2. *Division of an integral whole into its composing parts*

This is a division into parts which, taken together, make up a whole. It is of two kinds:

(a) Division of a substance into its parts. For example, we divide *man* into the composing parts of *body* and *soul*, or we can divide *man* into the composing parts of *arms*, *feet*, and so forth.

(b) Division of a definition into its parts. We define *man* as

*rational animal*. We can therefore divide *man* into *rational* and *animal*.

### 3. *Division by name*

In this kind of division, we divide a word into its different meanings, for example, the word “bow” into *knot* and *weapon*.

### 4. *Accidental division*

There are three kinds of accidental division:

(i) Division of a subject according to its accidents. For example, we divide *man* into *white*, *black*, *red*, *yellow*.

(b) Division of an accident according to its subjects. We divide *white* into *man*, *milk*, *snow*, and so forth, according to the subjects in which the accident of whiteness exists.

(c) Division of an accident according to its accidents. We can divide *white* into *sweet* and *sour*.

## QUESTIONS---CHAPTER FIVE

1. Why is division studied in logic?
2. Enumerate and explain the rules of division.
3. Explain the kinds of opposition used in division and give original examples.
4. Distinguish division, co-division, and subdivision. Illustrate with original examples.
5. Explain the kinds of division. What is the principal kind?

EXERCISE I--CHAPTER FIVE

Are the following divisions good or bad? Explain your answers.

1. *Book* into fiction and non-fiction.
- 2. *Animal* into those that can burrow, those that can fly, and those that can make sounds.
- 3. *Plane triangle* into scalene, isosceles, and equilateral.
4. *Color* into red, white, dark, light.
5. *Worker* into skilled, unskilled.
6. *Tree* into trunk, roots, limbs.
- 7. *Man* into artist, scientist, American.
8. *Seal* into animal, stamp.
- 9. *Color* into soft, loud.
10. *Art* into music, painting, cooking.



*EXERCISE II—CHAPTER FIVE*

Make a good division of the following topics, carrying the division through at least two subdivisions. (This may be done in outline form.)

1. Education
2. Government
3. Art
4. Religion
5. Quality
6. Automobile



EXERCISE III—CHAPTER FIVE

Outline the following paraphrase of a portion of Aristotle's *Ethics*.

Let us consider the position that happiness does not involve pleasure. There are some who think that no pleasure is good in any sense. There are others who think that some pleasures are good but most are bad. There are still others who think that even if all pleasures are good, yet the best thing cannot be pleasure. Various reasons are given for the view that pleasure is not good at all. Thus, a temperate man avoids pleasure. Again, a prudent man pursues what is free from pain, but not what is pleasant. Then, too, pleasures are an obstacle to thought. (We might note, here, that thought is speculative or practical, but in either case pleasure is an obstacle to thought.) There are also reasons for the view that not all pleasures are good. Thus, some pleasures are really base and objects of reproach. Further, some pleasures are harmful, either as unhealthy or as emotionally exhausting. The reason for the view that the best thing cannot be pleasure is that pleasure is not an end but a process.

## Chapter Six

### DEFINITION

A DEFINITION is that which explains the nature of a thing, all the points that we have treated so far in logic, definition most of all manifests the simple object. If we can define a thing well, we can be sure of knowing a thing well. We shall now, therefore, give the rules for making a good definition, after which we shall summarize the kinds of definition.

#### THE RULES OF DEFINITION

There are four rules of definition, all of which must be observed in order to obtain a good definition.

1. *The definition should be composed of genus and difference.*

Genus and difference have been explained in the predicables in Chapter Two. They are properly found in essential definitions; in other kinds of definition, at least something must be stated in place of a genus and in place of a true difference. Consequently, every good definition states both something *common* and something *distinctive*. For example, in the definition of man as a “rational animal,” *animal* is stated as the genus and *rational* is stated as the difference. *Animal* is common to the various kinds of animal while *rational* differentiates man from all other animals by stating what is proper to man.

2. *The definition and the definitum should be convertible.*

The *definitum* is the thing or nature that is being defined. The definition, strictly speaking, is the explanation of the definitum. Thus, in the example given above, “man” is the *definitum* and “rational animal” is the *definition*.

When we say that the definition and the definitum must be converti-

ble, we mean they can be validly exchanged. If this can be done, then the definition is a good one. Thus, we can validly convert *Man is a rational animal* to *A rational animal is man*, without in any way adding to or detracting from the definition.

If we were to say *Man is a two-footed animal*, we should discover that we could not validly say, in conversion, *A two-footed animal is man*, for *two-footed animal* includes more things than *man*, and hence is a bad definition.

Convertibility is the most direct way to test whether the definition is good.

### 3. *The definition should signify more clearly than the definitum.*

If the purpose of the definition is to manifest the definitum, it is obvious that the definition must be clearer than the definitum. Consequently, this rule eliminates the use of equivocal names, ambiguous expressions, obscure words, and negative expressions. Sometimes we may have to use negative names, but, so far as possible, they should be eliminated. In particular, the definitum should be excluded from the definition. We should not define a logician as a logical thinker.

### 4. *The definitum must be universal.*

No singular thing can be defined, for the singular is not an object of scientific knowledge. The definitum must be universal and must be a species under a genus. Consequently, a supreme genus or category cannot be defined, for it has no genus above it.

## THE KINDS OF DEFINITION

### 1. *Essential definition*

An essential, or real, definition is one that gives the essence of the thing signified by the name. The essential definition is always stated in terms of genus and true difference, for the genus and true difference express the essence of a thing.

*Rational animal* is an example of the real definition of man. *Animal* stands as the genus and *rational* as the true difference.

### 2. *Nominal definition*

A nominal definition designates the nature to which the name is applied but does not specify the essence of the thing through the genus and true difference. According to this meaning of nominal definition, anything short of a real or essential definition is a nominal

definition, either because such a definition does not explain a nature sufficiently or because the thing being defined does not have a nature, as definitions in grammar and definitions of artificial objects.

(a) *Definition by property.* A property is a proper accident of a thing, connected necessarily, only, and always with its nature. *Grammatical animal* is a definition of man by property, since grammatical is proper to man.

(&) *Definition by accident.* "Accident" here is understood as common accident. Common accidents are characteristics that belong to more than one nature, or are not necessarily connected with a nature, or are not always present in a nature. A definition by accident usually has to have two or more common accidents as the difference in order to satisfy the rule of convertibility in definition. Thus, it would not be sufficient to define man as a *biped animal*, although "two-footed" is a common accident of man. We can, however, achieve a satisfactory accidental definition of man by saying that man is a *featherless, biped animal*.

(c) *Definition by cause.* The causal definition is understood as applying to *extrinsic* causes, namely, to the efficient and final causes. Thus, we can define a human soul as *a form created by God for eternal happiness*, in which we specify the efficient cause *God* and the final cause *eternal happiness*. All artificial things are defined by their final cause or purpose.

A definition by *intrinsic* causes, namely by material and formal causes, reduces to an essential definition. Thus, man is *that which is composed of body and rational soul*, where *body* means *sensitive, animated body* (which is the same as *animal*) and where *rational soul* reduces to *rational*; hence, the essential definition of man is *rational animal*.

(d) *Definition by name.* A definition by name or word, or a verbal definition, explains the meaning of a word, either by etymology, as in philosophy is *the love of wisdom* (showing the Greek origin of the word), or by stating the common meaning of the word, as in the soul is *the principle of life*.

#### QUESTIONS---CHAPTER SIX

1. Explain how everything treated in Part One is ordered to definition.
2. Explain, with original examples, the first two rules of definition.
3. Why must the definitum be universal?
4. Explain the difference between essential and nominal definition.
5. Explain definition by extrinsic causes and by intrinsic causes, giving examples. What kind of definition is definition by intrinsic cause?



EXERCISE—CHAPTER SIX

Determine whether the following definitions are good or bad. If they are good, encircle the genus and underline the difference. Specify the kind of difference: specific difference, property, accident, or extrinsic cause. If they are bad, give the rule violated.

1. Man is an artistic animal.
2. Revenge is punishment inflicted to satisfy the feelings of the punisher.
3. A grammarian is one who is skilled in grammar.
4. A fish is an aquatic, jawed vertebrate with fins, scales, and gills, and a heart with one auricle.
5. A knife is an instrument used for cutting.

6. George Washington is the first president of the United States.
7. A rectangle is a right-angled parallelogram.
8. Thinking is the manipulation of memory.
9. A hammer is an instrument for driving nails, beating metals, and the like, consisting of a head, usually of steel, fixed crosswise to a handle.
10. Man is a living being capable of spontaneous movement and rapid motor response to stimulation.

## REVIEW QUESTIONS----PART ONE

In Part One of logic there is a certain amount of important doctrine. The following questions are designed to bring out the most important points that should be known. Answers to these questions are needed for the material in Part Two and Part Three.

### *Introduction*

1. What is logic?
2. Of what use is the study of logic?
3. What is a simple object?
4. What is a complex object?
5. What are the three acts of the intellect? Explain them.
6. What do formal logic and material logic have in common?
7. How is formal logic distinguished from material logic?

### *Chapter One*

8. What is a word?
9. Why does logic consider words?
10. Distinguish between words and concepts.
11. Define the sign.
12. What are the bases for the divisions of the sign?
13. What is the difference between natural and conventional signs?
14. Is a word a natural or conventional sign? Why?
15. Is a concept a natural or conventional sign? Why?

### *Chapter Two*

16. What is a universal?
17. What is a singular?
18. What is a logical universal?
19. What is a predicable?
20. Define *genus*; *species*; *specific difference*; *property*; *accident*.
21. Which of the predicables have an essential connection with their inferiors?
22. Which of the predicables have an accidental connection with their inferiors?
23. What question does the predicable "genus" answer?
24. What question does the predicable "species" answer?
25. What question does the predicable "specific difference" answer?

### *Chapter Three*

26. Define *univocal name*; *equivocal name*; *analogous name*.
27. Why is an analogous name said to be proportionately one?
28. What does *existence in a subject* mean?
29. What does *predicable of a subject* mean?
30. What is a singular substance? a universal substance?
31. What is a singular accident? a universal accident?

### *Chapter Four*

32. What is a category?
33. What is the purpose of studying the categories?
34. What four conditions have to be observed in determining the categories?
35. Name and explain each of the categories.
36. Name two kinds of quantity and give an example of each.
37. Name the four species of quality and give an example of each.



38. What is the difference between predicable accident and predicamental accident?
39. What is contradictory opposition? Give an example.
40. What is privative opposition? Give an example.
41. What is contrary opposition? Give an example.
42. What is the difference between immediate and mediate contrary opposition?
43. What is relative opposition? Give an example.
44. What is meant by *priority*?
45. What is the difference between priority of time and priority of nature?

*Chapter Five*

46. What is division?
47. How does division help us to know a thing?
48. What are the rules for a good division? Illustrate each rule.
49. What are the different kinds of division? Give examples.
50. What is the difference between subjective parts and composing parts?

*Chapter Six*

51. What is definition?
52. What is the importance of definition?
53. What are the rules for a good definition?
54. What is a definitum?
55. What is the difference between a real and a nominal definition?
56. What are the different kinds of nominal definition?

*Part Two*

*THE SECOND ACT OF THE INTELLECT-*  
COMPOSITION AND DIVISION



## TRUTH AND FALSITY

I Á/E have already referred, in the Introduction, to the second act of the intellect as the act of composition and division. The second act of the intellect combines or divides the simple objects that have been made known by the first act of the intellect. By the act of composition, we combine one simple object with another, as in *Man is artistic*. By the act of division, we deny one simple object of another, as in *Wealth is not happiness*. This composition and division of simple objects is not a mere juxtaposition of words, but an actual affirmation and denial. This affirmation or this denial is the “complex object” that specifies the second operation of the mind. The complex object distinguishes the second operation from the first, which is specified by the simple object.

By this second act of composition or division, we form propositions. Let us notice that we must first form a proposition in the mind before we can make a judgment. In a judgment, we assert that a composition or a division conforms to reality. The judgment will be true if the composition or division conforms, false if it does not. A judgment by our intellect presupposes that we have something to judge, namely, a composition or division of simple objects. We exercise judgment, then, on some composition or division of simple objects, and it is in this way that truth and falsity are in the second act of the intellect.

Let us examine what we mean by *truth* as we are using it here, for we use the word in more than one sense.

Speaking most generally, we say that our intellect seeks to know truth. Our intellect is made for truth, just as our sense of hearing is made for hearing sound. This is what we mean when we say that the true is the good of the intellect. Truth, then, implies some relation between an intellect and something known. Things, however, can be related to the intellect in two ways.

*In the first way, things are related to the intellect as measuring the*

intellect. A measure is a standard to which we compare other things. When what I know corresponds to things, what I know is measured by those things. My knowledge is then *speculatively* true. Speculative here is not meant in the popular sense of "theorizing from conjectures without sufficient evidence." Speculative truth is the conformity of the intellect to things, and speculative falsity is the lack of such conformity. Speculative truth is also called *formal truth*. For example, the proposition that a square has four sides is true because it conforms to reality, whereas the proposition that a square has three sides is false because it does not conform to reality.

The same conformity of intellect to thing occurs less perfectly in the first operation of the intellect, and also in what is called the truth of the senses. Thus, when we say that truth is found in the senses, we mean that our sense powers conform, in their knowing, to things in reality. For example, I see the color of a flower and what I see conforms to reality. However, my eye does not know this conformity, for the knowledge of this conformity requires intellectual understanding.

*In the second way*, a reverse relation occurs between things and the intellect, namely when things are related to the intellect as *measured* by the intellect. We are now considering the intellect as it knows in a *practical* way. In practical knowledge, our intellect is the cause of things, whereas in speculative knowledge, things are the cause of our knowledge.

Thus, the work of the artist is called true in so far as it conforms to the idea in the mind of the artist and as it attains the nature of the art. A work of art is called false in so far as it departs from this conformity. For example, an artificial object that is poorly designed for sitting cannot be truly called a chair.

Just as the artificial object is measured by the idea in the mind of the artist, so all natural objects are measured by the idea in the divine intellect. This conformity of natural objects to the divine intellect is called *transcendental truth*. Transcendental truth, then, is the truth that follows upon all being, and is therefore convertible with being.

When we speak of truth and falsity in logic, we are not speaking of practical truth and falsity. Logic is not concerned with the truth of making or with the truth of doing, the two divisions of practical truth, since logic is an instrument to aid us in arriving at truth in our knowledge of things. Logic is not concerned with transcendental truth, the truth convertible with being, for the study of the truth that is convertible with being belongs to metaphysics. Logic, finally, is not concerned with moral truth and falsity, that is, with telling a truth

and telling a lie. The conformity in moral truth is between speech and thought, not between thought and thing.

Logic is concerned only with speculative truth, in which our intellect knows the conformity between a proposition we form and things existing outside our intellect. By knowing this relation between thought and thing, we are able to judge the composition or division of simple objects that we have made as true or false.

#### QUESTIONS---CHAPTER SEVEN

1. What do we mean by the act of composition and the act of division?
2. Explain the ways in which things are related to an intellect.
3. What is speculative truth?
4. What is practical truth?
5. What do we mean by *truth of the senses*?
6. What do we mean by *transcendental truth*?
7. What do we mean by *moral truth*?
8. With what kind of truth are we concerned in logic?



## Chapter Eight

### THE PROPOSITION

A PROPOSITION is a composite expression that signifies by indicating the true or the false.

We have spoken of truth and falsity in the preceding chapter. Let us note here that truth or falsity is said to be in a proposition as a sign of true or false understanding. Truth or falsity, however, is in the mind as in a *subject*. Truth, finally, is in the thing as in a *cause* of the truth which is in the mind. Thus, because this dog is white, my knowledge that this dog is white is true, and the proposition by which I signify that knowledge is true. Hence we speak of the proposition as that which “signifies by indicating the true or the false.”

A composite expression is an orderly group of words. The proposition is one kind of composite expression. Let us examine the meaning of “composite expression” so as to understand better what a proposition is.

A composite expression is a whole whose parts signify something separately. This distinguishes a composite expression from a simple word, which signifies a simple object, as *man*, *tree*, *dog*, and so forth. A composite expression extends from a definition to full argumentation. Composite expression is divided into *perfect* and *imperfect*.

A perfect composite expression generates a complete meaning in the mind of the hearer. An imperfect composite expression fails to generate a complete meaning in the mind of the hearer; it leaves one in suspense because of the incompleteness of meaning, as in *while men are fighting*.

There are five kinds of perfect composite expression: deprecatives, imperatives, interrogatives, vocatives, and enunciatives. A deprecativ

\* “Composite expression” is used here to stand for *oratio* in Latin and *logos* in Greek, which would be better translated as “speech” except for difficulties of its use in English.



expression is a prayer (as, *Give us this day our daily bread.*). An imperative is a command (as, *Stand up!*). An interrogative is a question (as, *Who is coming?*). A vocative is an appeal (as, *O, dear friend!*). An enunciative is an enunciation or a proposition (as, *Man is wise.*).

We now see the full meaning of the definition of a proposition as a composite expression that signifies by indicating the true or the false. The proposition is, first of all, a perfect composite expression, and therefore has a complete meaning by itself. The proposition is distinguished from other kinds of perfect composite expression by its indication of the true or the false. We shall thus keep the proposition distinct from such other composite expressions as commands or prayers. The other kinds of composite expression are treated in rhetoric and grammar.

We have spoken of the proposition as *indicating* the true or the false. A proposition indicates the true or the false in so far as it predicates something of a subject. We predicate something of a subject either by affirming the predicate, as in *Man is wise*, or by denying the predicate, as in *Man is not wise*.

The elements of a proposition are the noun and the verb, out of which a proposition is formed in words. From the standpoint of logic, we include the pronoun and the adjective under the noun, and the participle under the verb.

A noun is defined as a vocal sound that signifies by convention, without time, and no part of which is significant separately. "Vocal sound" is stated as the genus, by which the noun is distinguished from all sounds that are not vocal, that is, sounds not involving some imagination. "Signifies" differentiates the noun from various non-significant vocal sounds, such as nonsense syllables. "By convention" differentiates the noun from vocal sounds that signify naturally, such as the groans of a sick person and the vocal sounds of animals. "Without time" differentiates the noun from the verb in so far as what the noun signifies is not measured by time. "No part of which is significant separately" differentiates the noun from a composite expression, such as *wise man*, in which the parts signify something separately.

A verb is a vocal sound that signifies with time and is always a sign of those things predicated of another. In this definition of the verb, only that which distinguishes the verb from the noun is given; otherwise the definition of the verb is the same as that of the noun. Notice that the verb signifies *with* time. Since motion, which consists of action and passion, is measured first and principally by time, the verb, which signifies action or passion, signifies with time. The verb is also a sign of the attribution of a predicate to a subject, either when signifying the predicate itself, as in *Paul is* (meaning, *Paul*

*exists*), or when uniting the predicate to the subject, as in *Paul is wise*.

The noun and the verb, therefore, are the necessary elements of a proposition. We cannot express a proposition in words without at least a noun and a verb. There are times, it is true, when we seem to use only one word to express a proposition. For example, if someone asks me, "Who is studying in the room?" I can answer simply, "Paul." However, it is clear that I am merely using a short-cut expression that means, in the context of the question, "Paul is studying." Similarly, "Yes" can signify an affirmative proposition in answer to a question, and "No" can signify a negative proposition. Thus, if someone asks me, "Are you tired?" I can answer, No," as a short-cut expression for "I am not tired."

We also speak of the subject, predicate, and copula in a proposition. In the proposition *Man is wise*, *man* is used as a subject, as *that of which* something is predicated. *Wise* is used as a predicate, as *that which* is predicated of an inferior. *Is* is used as a copula, as a sign of the joining of the predicate to the subject. The subject and the predicate are the matter of the proposition. The copula is the form of the proposition.

We shall see in the following chapters that it is frequently useful to put propositions into what is called "logical form." The logical form of a proposition is the explicit expression of the subject, predicate, and copula as distinct parts of the proposition, as in *Man* (subject) *is* (copula) *artistic* (predicate). Sometimes propositions will have to be restated in logical form to bring out the parts of the proposition more clearly. The proposition *Paul walks* can be stated more explicitly, in logical form, as *Paul is one who walks*.

#### QUESTIONS----CHAPTER EIGHT

1. Define *proposition*.
2. What do we mean by a "composite expression"?
3. Distinguish between perfect and imperfect composite expression.
4. Explain the different kinds of perfect composite expression. Give examples of each.
5. What do we mean by speaking of the proposition as "indicating" the true or the false?
6. Define *noun*. Explain the parts of the definition.
7. Define *verb*. Explain the parts of the definition.
8. What is the "logical form" of a proposition?



EXERCISE I—CHAPTER EIGHT

In the following composite expressions, write “Yes” if the composite expression is a proposition, “No” if it is not. In those that are propositions, underline the subject once, the predicate twice, and encircle the copula.

1. I should like to meet your friend.
2. No dogs allowed.
3. Students are serious.
4. Some men are tenors.
5. A question is an interrogative expression.
6. Come into the room for a moment.
7. Every composer is a musician.
8. When will the class be over?
9. The prohibition against smoking is a new regulation.
10. Soldiers are not cowards.
11. Have exact fare ready when entering car.
12. No sophomore is eligible for scholarships.
13. I wonder whether I was nominated.
14. He who fights for his country is patriotic.
15. Some citizens are non-voters.
16. Forgive our faults.
17. No non-graduates are able to apply.
18. I am available.
19. Consider the moral, I pray.
20. He who thinks he is wise is not wise.



EXERCISE II—CHAPTER EIGHT

In the following propositions, write “Yes” if the proposition is in logical form, “No” if not. Re-write in logical form those that are not.

1. No dog is a cat.
2. Every good logician is able to reason correctly.
3. Man dies.
4. Some fruit is sour.
5. Every good man comes to the aid of his party.
6. No American advocates the overthrowing of his government.
7. Not every proposition has logical form.
8. He who is in trouble deserves sympathy.
9. I am human.
10. Comforting are the words of a friend.
- 11. All those who have voted have done their duty.
- 12. Automobiles are expensive.
- 13. A friend in need is a friend indeed.
- 14. Not all who have answered have answered correctly.
- 15. Every sale that is successful sells the company.
- 16. Great books become lasting possessions.



## *Divisions OF THE PROPOSITION.*

THE different kinds of proposition are obtained by dividing the proposition according to various bases of division.

### I. ACCORDING TO UNITY

The unity of a proposition is determined by the unity of the composition made by the mind in forming a proposition. This unity may be simple or complex.

The categorical proposition is *simply* one because it signifies one composition in the intellect, as in *Man is mortal*. It is composed simply of subject, predicate, and copula.

The compound proposition is one *by conjunction*, because it signifies more than one composition in the intellect, as in *If horses are animals, then horses have sensation*. The compound proposition is composed of categorical propositions.

The categorical proposition and the compound proposition differ according to the kind of copula each has and according to the kind of parts each has. The copula of the categorical proposition is a verb. The copula of the compound proposition is some connective, such as *if, then, and, neither, or*, and so forth. The parts of the categorical proposition are the subject, predicate, and verb copula. The parts of the compound proposition are categorical propositions united by various connectives.

### II. ACCORDING TO QUALITY

The division of a proposition according to quality is a division into its species—into affirmative and negative propositions. This is a division of the proposition into species because affirmative and negative propositions differ in their very manner of combining the predicate with the subject.



An affirmative proposition is a proposition in which the predicate is united with the subject, as in *Man is wise*. The verb copula must be affirmative.

A negative proposition is one in which the predicate is separated from the subject, as in *Man is not wise*. The verb copula must then be negative.

The distinction between affirmative and negative propositions is undoubtedly clear enough, but sometimes it is not immediately evident whether a proposition is really affirmative or negative in form. The following suggestions will help to make the distinction accurately.

Compound propositions are always affirmative. This is because the copula in the compound proposition is a connective and not a verb. The connective copulas of the compound proposition must combine the parts of the compound proposition; that is, they must join together categorical propositions. For example, the compound proposition *If it is not cloudy, then it is not raining* is an affirmative compound proposition because of the connectives *if* and *then*, even though the parts of the compound proposition (the categorical propositions) have negative verb copulas.

In categorical propositions, the verb copula determines whether the proposition is affirmative or negative. Some propositions may contain more than one verb, but it is only the verb copula that determines the quality of the proposition. Thus, the proposition *Students who are not seniors are eligible* is an affirmative proposition because the verb *are* functions as the copula of the proposition and is affirmative.

Negated subjects and negated predicates will not make the proposition negative in quality unless the verb copula itself is negative. The proposition *Non-seniors are ineligible* is an affirmative proposition even though both the subject and the predicate are negative words.

### III. ACCORDING TO QUANTITY

This division of the proposition is taken according to the quantity of the subject of the proposition.

When the subject of a proposition is a singular, the proposition is singular, as in *Paul is wise* or in *This man is wise*. Notice that the singular in logic means "this one and no other." It does not mean the grammatically singular, as opposed to the grammatically plural. The proposition *Every man is wise* is grammatically singular but not logically singular. ,

When the subject of a proposition is a universal name, then something can be predicated of the subject in three ways: universally, particularly, and indefinitely. In the proposition *Every man is wise*

the predicate *wise* is said of *every man*, thus making the proposition universal. In the proposition *some man is wise* the predicate *wise* is said of *some man*, thus making the proposition particular. Notice that the subject of the particular proposition is the vague individual (*some man*), which is to be kept distinct, however, from the subject of a singular proposition (*this man*). In the proposition *Man is wise* the predicate *wise* is said of *man* without any quantitative modifier, thus making it an indefinite proposition with respect to quantity.

The use of a negation affects the quantity of a proposition as well as the quality. We have already seen that the proposition *Every man is wise* is a universal affirmative proposition. A negation placed before such a proposition has the effect of changing both its quality and quantity. Thus, *Not every man is wise* is negative because the *not* changes the copula from affirmative to negative; the proposition is also particular because the *not* denies the *every* and therefore changes it to the particular. Hence, *Not every man is wise* is equivalent to saying *Some man is not wise*. For the same reason, a proposition such as *All books are not interesting*, despite its appearance, is particular and negative in meaning.

#### IV. ACCORDING TO THE MATTER OF THE PROPOSITION

The division of the proposition according to the matter indicates the relation of the predicate to the subject.

A proposition has necessary matter when the predicate is in the subject per se, that is, when the predicate belongs to the essence of the subject and is therefore related necessarily to the subject. The proposition *Man is grammatical* has necessary matter because the predicate *grammatical* is necessarily connected with the essence of man.

A proposition has impossible matter when the predicate is per se repugnant to the subject, that is, when the subject and the predicate are incompatible with each other. The proposition *Dogs are immortal* has impossible matter because the predicate *immortal* cannot belong to the subject *dogs*.

A proposition has contingent matter when the predicate is neither per se in the subject nor per se repugnant to the subject, that is, when the predicate is such that it may or may not belong to the subject. The proposition *Man is white* has contingent matter because the predicate *white* may or may not be in the subject *man*. In other words, there is no necessary relation between the subject and the predicate in a proposition having contingent matter.

# V. ACCORDING AS THE MODE OF COMPOSITION IS EXPRESSED OR NOT

This is a division of the proposition according to whether or not the modality of a proposition is explicitly expressed.

A simple proposition (also called *de inesse*) is a proposition that does not express explicitly the mode of the composition in the proposition.

A modal proposition is one in which the verb copula is affected by a sign indicating in what mode the predicate belongs or does not belong to the subject. There are four modes that can be expressed in a proposition: necessity, impossibility, possibility, and contingency.

Consider the proposition *Man is grammatical*. Although, as we saw in the preceding section, this proposition has necessary matter, nevertheless it does not express explicitly the modality of the proposition, that is, it does not state that man necessarily is grammatical. Consequently, *Man is grammatical* is a simple, or non-modal, proposition.

A proposition becomes modal, therefore, when one of the four modes is explicitly expressed in it. *Man is necessarily grammatical* is a modal proposition because the mode of necessity is explicitly expressed.

In order to understand the structure of the modal proposition, we distinguish the dictum from the mode. The dictum of a modal proposition is the composition of predicate and subject. The mode is the manner or modality of that composition. Thus, in the modal proposition *Man is necessarily grammatical*, the composition *man is grammatical* is the dictum and *necessarily* is the mode.

In terms of this distinction, the modal proposition is defined as a proposition that modifies its dictum. Thus, the mode in the modal proposition modifies the composition of the dictum, as *necessarily* modifies, through the verb, the composition *man is grammatical*.

A modal proposition can be expressed in grammatically different ways. We can say *Man is contingently white* or *It is contingent that man is white* or *That man is white is contingent*. These propositions differ only grammatically. So far as logic is concerned, all are equally modal propositions, and they are all the same modal proposition.

A modal proposition is made negative by negating the mode. The quality of the modal proposition is not affected by the quality of the dictum. Thus, the modal proposition *It is not contingent that man is grammatical* is a negative modal proposition because the mode is

negated, even though the dictum remains affirmative. The dictum, of course, can also be negative in a negative modal proposition, as in *It is not possible that man is not grammatical*. The modal proposition *It is possible that man not be white* is affirmative even though the dictum is negative.

#### QUESTIONS----CHAPTER NINE

1. What are the various bases of division for determining the kinds of propositions?
2. Distinguish between a categorical proposition and a compound proposition.
3. Why are compound propositions always affirmative?
4. When is a proposition universal? When particular?
5. What is an indefinite proposition?
6. Is the proposition *Every dog is an animal* logically singular? Explain.
7. When does a proposition have necessary matter? impossible matter? contingent matter?
8. Distinguish the *dictum* from the *mode* in a modal proposition.



EXERCISE I—CHAPTER NINE

Classify the following propositions as categorical or compound. If categorical, classify as affirmative or negative; universal, particular, singular, or indefinite.

- \_\_\_\_\_ 1. Some men are not handsome.
- \_\_\_\_\_ 2. Man is artistic.
- \_\_\_\_\_ 3. Some books that are not entertaining are non-fiction.
- \_\_\_\_\_ 4. Every dog has his day.
- \_\_\_\_\_ 5. Not every proposition is universal.
- \_\_\_\_\_ 6. If labor is scarce then labor is expensive.
- \_\_\_\_\_ 7. This book is uninteresting.
- \_\_\_\_\_ 8. Man is irrational.
- \_\_\_\_\_ 9. Students either pass or fail courses.
- \_\_\_\_\_ 10. No science is opinion.

EXERCISE II—CHAPTER NINE

In the above exercise, turn the following into true modal propositions:

- 1.
- 2.
- 8.
- 10.



## Chapter Ten

### SUPPOSITION

SUPPOSITION concerns the use of words within a proposition, the use of words as subjects and predicates of propositions. Supposition, therefore, is a property of the parts of the proposition; more specifically, it is a property of the extremes of the proposition, the subject and the predicate.

Let us first distinguish between signification and supposition, for these two are often confused. The signification of a word is, as we have seen, the meaning of a word. A word signifies conventionally the concept we have of a thing. The supposition of a word presupposes the signification of a word, for we cannot tell how to use words in propositions unless we know what the words mean. We must know, then, what words signify before we can *use* them to stand as the subject or predicate of a proposition.

Let us take, for example, the word "man." The signification of the word "man" is the meaning of the word, that is, the concept that the word conventionally signifies; the concept, in turn, is a natural sign of the nature of man. The signification of "man" is the same whether the word is within a proposition or outside of a proposition.

The supposition of "man" does not arise until we make use of the word in a proposition<sup>^</sup> as in *Man is artistic*. In *Man is artistic* the word "man" is used so as to have a certain connection with the other words in the proposition. More specifically, it stands as the subject of the proposition. Consequently, the supposition of "man" adds nothing to the signification of the term. The supposition merely makes use of the meaning of "man" in a proposition.

Hence, the question of the supposition of terms in a proposition reduces to the following. Given the signification of "man," can it then be used (can it "suppose") as the subject of a proposition? Is the signification of the word capable of standing, in relation to the copula, as the logical subject?



### DEFINITION OF SUPPOSITION

With this preliminary clarification, we can now define supposition as *the use of a word for an extreme of a proposition according to the requirement of the copula.*

By the phrase “the use of a word for an extreme of a proposition,” we mean the substitution of the word for a subject or a predicate of a proposition. In the proposition *Man is artistic*, “man” stands for the logical subject, and “artistic” stands for the logical predicate.

By the phrase “according to the requirement of the copula,” we mean that the supposition of words as subjects and predicates depends upon the kind of existence that the copula is signifying, namely, past, present, or future. Let us notice, however, that in some propositions the copula signifies an existence independent of time. For example, in the proposition *Every man is mortal*, the copula *is* signifies an existence independent of time in the sense that the copula does not limit the time to any given period—the past only, the present only, or the future only—but signifies, rather, an eternal existence. Whenever a proposition has a universal subject that signifies a nature, such a subject will always satisfy the requirement of the copula, since a nature as such does not have past, present, or future.

When, however, the copula of a proposition signifies a definite-period of time, then the words standing as the subject must signify something that has an actual existence in time in agreement with the time signified by the copula. For example, in the proposition *George Washington was a president of the United States*, the words “George Washington” can suppose as the logical subject, since the words signify someone existing at the time demanded by the copula.

But if I were to form the proposition *George Washington will be a president of the United States*, I should then have a proposition in which the words “George Washington” do not suppose as the subject of a proposition, for the copula demands the future existence of someone, but the words “George Washington” are intended to refer to someone who existed in the past. Such a proposition is an example of what is called a “proposition with a non-supposing subject.” Such a proposition will always be a false proposition, though not a “meaningless proposition,” as it sometimes has been called. A non-supposing subject occurs in a proposition, therefore, when the copula signifies a time of existence at which the subject could not exist.

### THE KINDS OF SUPPOSITION

There are two kinds of supposition: proper and improper.

Improper supposition is the use of a word in a proposition as it signifies in a metaphorical sense. For example, in *The lion of the tribe of Juda conquers*, "lion," standing as the subject of the proposition, signifies Christ metaphorically.

Proper supposition is the use of a word in a proposition as it signifies in a literal sense. For example, in *Every lion is an animal*, "lion," standing as the subject of the proposition, signifies literally a certain kind of animal. Proper supposition is divided further into material, simple, and personal supposition.

Material supposition is the use of a word to represent itself, as in "*Running*" is a verb, "*Tree*" is a noun, and "*Country*" is a word of two syllables. In material supposition, we merely consider the matter of a word—the appearance of the word in sound or writing—without explicitly considering the form of the word, that is, its meaning.

Simple supposition is the use of a word to signify the nature of something as it is in our intellect, as in *Man is a species*. In simple supposition, we use a word to signify a nature conceived in the mind, without reference to the existence it has in actual individuals. In the proposition *Man is a species*, "man" is used to signify human nature as such, and does not include in its signification the individuals (Paul, James, John) in whom the nature of man actually exists.

Personal supposition is the use of a word to signify both the nature and the individuals in which the nature is found, as in *Man is an animal*. A word used with personal supposition signifies immediately the nature itself and mediately the individuals of that nature. In the proposition *Man is an animal*, "man" is used to signify immediately human nature and mediately Paul, who, being a man, is also animal.

Notice carefully the distinction between simple and personal supposition. Simple supposition is the use of a word to signify a nature conceived apart from the existence of the nature in individuals. Personal supposition is the use of a word to signify the real existence of a nature in individuals. When we examine later the opposition of propositions, and the syllogism, we shall see that it is necessary to keep the same supposition of words in order to avoid fallacies.

### DISTRIBUTION OF THE SUBJECT AND PREDICATE IN PROPOSITIONS

The distribution of the subject and the predicate in a proposition refers to the supposition of a universal name in a proposition. Distribution

is a question of whether the supposition of a universal name includes all the individuals under it, or only some. A universal name is distributed if it refers to all the individuals. It is undistributed if it refers only to some of the individuals. The question of distribution, therefore, does not properly arise in the case of a singular word.

There are four rules governing the distribution of words in a proposition.

1. *Every universal proposition distributes the subject*

A universal proposition is one whose subject is modified by some universal sign; hence, the subject of a universal proposition is distributed, that is, the subject supposes universally. Examples: *Every man is an animal* and *No man is a stone*.

It is well to distinguish here between a subject that supposes universally and one that supposes collectively. A subject that supposes universally stands for each and every individual under it, as in *Every man is an animal*, because the universal subject is distributed to all the individuals included under it. A subject that supposes collectively stands for a group of individuals taken, not individually and separately, but together as an aggregate whole, as in *The apostles were twelve in number*.

Notice in this connection that the universal proposition is better expressed in the form *Every man is an animal* than in the form *All men are animals*. The use of *every* with a singular verb expresses the distribution of a universal word to each and every singular included under it. The use of *all* with a plural verb does not express this distribution so clearly. In English the word *all* has a certain ambiguity that has misled some logicians in their analysis of propositions, especially those who interpret the universal as a class of objects. The first meaning of the word *all* is "the whole of," referring to the amount of, as when we say "All the wheat. . . ." The second meaning of *all* is "the whole number or sum of," as in "All the apostles were twelve." It is only in its third meaning that *all* designates the distribution of a universal name to each and every singular included under it, as in *All men are animals*. The use of *all* for the distribution of a universal name is not incorrect but we should avoid its ambiguity by understanding it only in its third meaning, when it is used as a sign of universality.

2. *Every particular proposition has an undistributed subject*

A particular proposition is one whose subject is modified by a sign denoting particularity. Examples: *Some man is wise* (*Some men are wise*) and *Some man is not wise* (*Some men are not wise*).

An indefinite proposition, formally considered, should be treated as having an undistributed subject. For example, the proposition *Man is wise* is sufficiently verified by a particular instance, and hence the subject *man* is taken as undistributed.

3. *Every negative proposition distributes its predicate*

A proposition is negative when the copula is negative. The negative copula always makes the predicate universal in distribution, for the predicate of a negative proposition is universally separated from its subject. For this reason the predicate of every negative proposition is distributed. Examples: *No cat is a dog* and *Some man is not honest*.

4. *Every affirmative proposition has an undistributed predicate*

A proposition is affirmative when the copula is affirmative. The affirmative copula always makes the predicate undistributed, or particular. The reason for this is that the predicate, as predicate, is more universal than the subject. Since it is taken as more universal than the subject, it cannot be predicated in its full universality, for it cannot be identified with the subject. Consequently, the predicate has to be reduced from universality to particularity to be identified with the subject. For example, in the proposition *Every tulip is a flower*, *flower* is more universal than *tulip*. Therefore, we cannot predicate *flower* universally of *tulip*: *Every tulip is (every) flower*. Consequently, we must reduce the universality of *flower* and predicate it only as a particular, or as undistributed: *Every tulip is (some) flower*. Now we can see why the fourth rule of distribution says that every affirmative proposition has an undistributed predicate.

Examples of affirmative propositions with undistributed predicates are: *Every oak is a tree* and *Some weed is poisonous*.

**QUESTIONS----CHAPTER TEN**

1. Distinguish between supposition and signification.
2. Explain how supposition is a property of the parts of a proposition.
3. Define *supposition*.
4. What kinds of existence does a copula signify?
5. When does the subject of a proposition not have supposition?
6. What are the kinds of supposition?
7. What is the difference between material, simple, and personal supposition? Give examples of each.
8. What do we mean by the distribution of the subject and the predicate in a proposition?
9. What are the four rules of distribution? Illustrate each rule with examples.
10. What is the difference between a subject that supposes universally and a subject that supposes collectively?

*EXERCISE—CHAPTER TEN*

Classify the subjects and predicates of the following propositions as distributed or undistributed. Put “D” for “distributed” or “U” for “undistributed” above each subject and predicate.

1. Every flower is a plant.
2. No horse is a dog.
3. Some man is courageous.
4. Animals are wild.
5. Some music is not beautiful.
6. Not every lion is tame.
7. All sports are contests.
8. Some books are nonfiction.
9. Some freshman studies logic.
10. Corruption is universal.
11. Every non-veteran is ineligible.
12. Each man dies.
13. All fruit is not sweet.
14. Any book is interesting.
15. Not everyone who passes the test is acceptable.
16. No logician makes fallacies.
17. Man contemplates.
18. Some non-freshman takes logic.
19. Every instrument is useful.
20. Some non-veterans are not non-graduates.



## OPPOSITION OF PROPOSITIONS

THE opposition of propositions is a property of the whole proposition, as distinct from supposition, which is a property of the parts of the proposition. We are now concerned with the relation of one proposition, as a whole, to another proposition.

Opposition is defined as the *affirmation and negation of the same predicate in regard to the same subject*. For example, the propositions *Every man is wise* and *No man is wise* are opposed because the same predicate *wise* in one proposition is affirmed of the same subject of which it is denied in the other proposition. *Every man is happy* and *No man is wise* are not in opposition because the predicates are different.

Even when the same words are used as the subject and predicate of propositions, we must be sure that the words have the same signification and the same supposition. By “same signification” we mean that the words must signify univocally and not equivocally. The two propositions *Every pen is large* and *No pen is large* are not in opposition if the word “pen” signifies a writing instrument in the first proposition and a small enclosure for animals in the second proposition.

By “same supposition” we mean that the words standing as the subject or predicate in the propositions must remain within the same genus of supposition. For example, two propositions will not be in opposition if the subject of one is used in proper supposition and the subject of the other is used in improper or metaphorical supposition. Thus, we sometimes speak of human beings metaphorically as angels, and hence might say *Some human beings are angels*. Such a proposition, however, would not be in opposition to *No human beings are angels* if we used “angels” properly in this proposition to stand for purely spiritual creatures.



## THE DIVISION OF OPPOSITION

This division is based upon the division of the proposition into its species—into affirmative and negative propositions.

1. *Contradictory opposition*

Contradictory opposition of propositions consists in removing an affirmation in one proposition by a negation in the other. Contradictory opposition is an opposition in truth and falsity; that is, contradictory propositions cannot both be true at the same time, nor both be false at the same time. For example, the affirmative proposition *Every man is wise* is contradicted by the negative proposition *Not every man is wise*, or *Some man is not wise*. Likewise, the negative proposition *No man is wise* is contradicted by the affirmative proposition *Some man is wise*.

Propositions with universal names as subjects are in contradictory opposition when they differ both in quality (affirmative and negative) and in quantity (universal and particular). Propositions with singular names as subjects are in contradictory opposition when they differ in quality even though no difference in quantity is possible. The proposition *John is handsome* is contradicted by the proposition *John is not handsome*.

2. *Contrary opposition*

Contrary opposition of propositions consists of a difference in quality and an agreement in universal quantity. Contrary opposition is an opposition in truth, but not in falsity. Hence, contrary propositions cannot both be true, although they can both be false, at the same time.

The proposition *Every man is wise* is contrary to *No man is wise*. Hence, if it is true that every man is wise, then it would have to be false that no man is wise. On the other hand, if it is true that no man is wise, then it would have to be false that every man is wise. However, contrary propositions may both be false, but this can be determined only by referring to the matter of the propositions.

3. *Sub-contrary opposition*

Sub-contrary opposition of propositions consists of a difference in quality and an agreement in particular quantity. Sub-contrary opposition is an opposition in falsity, but not in truth. Hence, sub-contrary propositions cannot both be false, although they can both be true, at the same time.

The proposition *Some man is wise* is in sub-contrary opposition with *Some man is not wise*. Hence, if it is false that some man is wise, then it would have to be true that some man is not wise; or if it is false

that some man is not wise, then it would have to be true that some man is wise. However, sub-contrary propositions may both be true at the same time, but this can be determined only by referring to the matter of the propositions.

It is clear from the definition of the different kinds of opposition that contradiction is the strongest or greatest kind of opposition of propositions. In contradictory opposition, one proposition simply destroys or denies the other, for the opposition of contradiction is a complete opposition of truth and falsity, of affirmative and negative and of universal and particular. Contrary opposition while having an opposition of quality and an opposition of truth, nevertheless has agreement in universal quantity and can also have agreement in falsity. Sub-contrary opposition also has an opposition in quality, but it has agreement in particular quantity and can have agreement in truth.

Sub-contrary opposition, however, departs from the definition of opposition, which requires affirmation and negation of the same predicate of the same subject. The subject of a particular affirmative proposition may not stand for the same thing that the subject of a particular negative proposition stands for. This is because the subject of a particular proposition is not taken for some determinate singular, but indeterminately for any, and hence the two subjects of a particular proposition may not stand for the same thing. For example, in *Some man is wise* and *Some man is not wise* the "Some man" may not be the same in both propositions. Opposition is thus verified less and less as we proceed from contradictory to contrary to sub-contrary opposition.

In addition to these three kinds of opposition, we shall also consider here the relation of propositions known as "subalternation." Subalternation of propositions is a relation in which two propositions agree in quality but differ in quantity. Thus, the proposition *Some man is wise* is subalternated to *Every man is wise*. Likewise, the proposition *Some man is not wise* is subalternated to *No man is wise*. In subalternation, if the universal proposition is true, the subalternated proposition under it is true. Thus, if it is true that every man is wise, then it would have to be true that some man is wise. However, if we only know that the particular proposition is true, we cannot know that the universal proposition has to be true. For example, if we know it is true that some man is just, we cannot determine from this alone that it is true that every man is just.

It must be emphasized, however, that the relation of subalternation is not a relation of opposition. The opposition of propositions is based upon the division of propositions into affirmative and negative. In subalternation, there is no opposition of affirmation and negation, for propositions in subalternation agree in quality, that is, they are either both affirmative or both negative. Furthermore, they do not

differ in truth or falsity, but are either both true or both false. Subalternation of propositions, nevertheless, is treated with opposition in order to complete a study of the relations between propositions. And in subalternation as well as in opposition, the terms in the proposition must retain the same signification and the same supposition; otherwise the various relations of truth and falsity will not validly hold.

Let us now try to simplify and summarize this material on opposition and subalternation. We shall do this by using the *Square of Opposition*, a graphic device that makes the different relations of propositions concrete.

The letters *A*, *E*, *I*, *O* symbolize the different kinds of propositions. The letter *A* stands for the universal affirmative, the letter *E* for the universal negative, the letter *I* for the particular affirmative, and the letter *O* for the particular negative proposition.

The lines in the square represent the following relations. The diagonal lines *AO* and *EI* represent the contradictories. The line *AE* represents the contraries. The line *IO* represents the sub-contraries. The parallel lines *AI* and *EO* represent the relations of subalternation.

#### RULES FOR TRUTH AND FALSITY

The rules for truth and falsity on the Square of Opposition can be summarized as follows. These rules follow from the definitions of the kinds of opposition and from the definition of subalternation.

##### 1. *Contradictories*

*Contradictories cannot be true at the same time or false at the same time.* In contradictory propositions, whenever one proposition is true,

\* The Square of Opposition is a device for seeing the relations between propositions that do not have a singular name as a subject.

the other proposition is false; and whenever one proposition is false, the other is true.

## 2. *Contraries*

*Contraries cannot be true at the same time.* In contrary propositions, whenever one proposition is true, the other is false. However, when one proposition is false, the other may be true or may be false, that is to say, the second proposition may be either. Since we cannot tell from the formal relation of contrariety whether the second proposition is true or false, we say that it is "unknown." Hence, whenever one proposition is false, the other is unknown.

## 3. *Sub-contraries*

*Sub-contraries cannot be false at the same time.* In sub-contrary propositions, whenever one proposition is false, the other is true. However, when one proposition is true, the other may be true or may be false. Hence, in sub-contrary relation of propositions, whenever one proposition is true, the other is unknown.

## 4. *Subalternates*

*Whenever the universal is true the particular is true, and whenever the particular is false the universal is false.* In the relation of subalternation, whenever a universal affirmative proposition is true, the particular affirmative proposition under it is true. Similarly, whenever the universal negative proposition is true, the particular negative under it is true.

Likewise, whenever the particular affirmative proposition is false, the universal affirmative above it is false. And whenever the particular negative proposition is false, the universal negative above it is false.

However, if the particular affirmative proposition is true, the universal affirmative may be true or may be false, and hence is unknown; and if the particular negative proposition is true, the universal negative is unknown. Likewise, if the universal affirmative proposition is false, the particular affirmative under it is unknown; and if the universal negative proposition is false, the particular negative under it is unknown.

# THE FORMAL RELATIONS OF PROPOSITIONS

Opposition and subalternation are formal relations of propositions. They are relations that abstract, in part, from the things signified. For example, we can express the opposition of contradiction formally

as *Every A is B* and *Some A is not B*. From the formal relation of contradiction alone, we know that of the two propositions, one must be true and the other must be false. We cannot tell, from the formal relations alone, which of the propositions is the true one, but only that if one is true, the other must be false.

Now a proposition is said to be "unknown" when its truth or falsity cannot be determined by formal relations alone. However, in the case of contradiction, no proposition is ever unknown, because contradiction is a complete opposition in truth and falsity; that is, one proposition is always true and the other always false. But in relations of opposition apart from contradiction, a relation may arise in which one of the propositions will not be necessarily true nor necessarily false, and therefore will be called "unknown." For example, in contrary opposition, if *Every A is B* is false, we cannot tell, by the formal relation alone, whether *No A is B* is true or false, and hence we say that it is "unknown."

However, when we put propositions into words, we reveal fully the matter. We can then determine the truth or falsity of the propositions on the part of matter as well as on the part of form. For example, we can state a contradictory opposition in words by opposing *Every man is just* to *Some man is not just*. When the propositions are put into words, the formal relation of contradiction still holds so that we can state that if one is true, the other is false. But the matter of the propositions, as revealed in the words, tells us that in this case the proposition *Some man is not just* is actually the true one, and that *Every man is just* is false.

Nevertheless, whether the propositions are stated with letters or with words, we shall, when using the Square of Opposition, consider only the form of the proposition, and only the formal relations of truth and falsity.

#### QUESTIONS---CHAPTER ELEVEN

1. What does it mean to say that opposition is a property of the whole proposition?
2. Define *opposition*.
3. Explain how the terms of propositions that are opposed must have the same signification and the same supposition.
4. What is the basis for the division of the opposition of propositions?
5. Name the kinds of opposition and give examples of each.
6. Why is contradiction the greatest kind of opposition?
7. Why is subalternation not opposition?
8. What do the symbols *A*, *E*, *I*, *O* stand for?
9. State the rules for truth and falsity in opposition.
10. What do we mean when we say that a proposition is "unknown"?
11. What do we mean by formal relations of opposition?
12. What does the matter of a proposition add to the formal relations?

Put *True*, *False*, or *Unknown* in the following spaces.

1. If A is true, then O is-----
2. If A is false, then I is\_\_\_\_\_ .\_\_\_\_\_
3. If E is true, then A is
4. If O is false, then A is
5. If I is false, then O is
6. If O is true, then E is
7. If A is false, then E is
8. If O and E are both false, then I is-----
9. If A is false and if O is true, then I is
10. If O is unknown and if I is true, then E is -----
11. If I is true and if A is false, then E is-----
12. If O is false, then E is\_\_\_\_\_, .. and I is                      and  
     A is-----

EXERCISE II—CHAPTER ELEVEN

Using the rules of the Square of Opposition, put *True*, *False*, or *Unknown* in the following spaces.

1. If it is true that some animals are not tame, then

(a) *Some animals are tame* is

(b) *All animals are tame* is

2. If it is false that some games are harmful, then

(a) *Every game is harmful* is

(b) *No game is harmful* is

3. If it is true that no artist is rich, then

(a) *Some artist is not rich* is

(b) *Some artist is rich* is

4. If it is false that all men are courteous, then

(a) *Not all men are courteous* is \_\_\_\_\_

(b) *Some men are courteous* is

(c) *Every man is not courteous* is

(d) *No men are courteous* is

(e) *Some men are not courteous* is-----

### EXERCISE III—CHAPTER ELEVEN

Determine whether the following propositions are *validly* or *invalidly* related according to the Square of Opposition.

1. If it is true that *No politicians are bookkeepers*, then it is false that *Some politicians are bookkeepers*.
2. If it is true that *Some drama is not interesting*, then it is false that *Some drama is interesting*.
3. If it is true that *Some apples are sweet*, then it is true that *Some apples are not sweet*.
4. If it is false that *No Americans are red-blooded*, then it is true that *Some Americans are not red-blooded*.
- \_\_\_\_\_ 5. If it is false that *Some food is not expensive*, then it is false that *No food is expensive*.
- , \_\_\_\_\_ 6. Suppose it is true that *All bats are blind*. Then it would have to be false that *No bats are blind* and false that *Some bats are not blind*.
7. If it is true that *Some teachers are scholars*, then it is false that *No teachers are scholars* and true that *All teachers are scholars*.
- 8. If it is true that *No logicians are bachelors* and if it is false that *All logicians are bachelors*, then it is true that *Some logicians are not bachelors*.
- 9. Let us suppose that I do not know whether it is true or false that *All logic texts are stimulating*. But let us suppose that I do know it is true that *Some logic texts are stimulating*. From this, then, I know that it is false that *No logic texts are stimulating*. But now I do know it is true that *All logic texts are stimulating*.
10. If it is true that *Not every proposition is false*, then it is false that *Some propositions are true*.



11. A sophomore claims that *Some freshmen are immature*. He has to hold, then, that it is also true that *Some freshmen are not immature* as well as holding it is false that *No freshmen are immature*.
12. If it is false that *Some peanuts are not salty*, then it is false that *No peanuts are salty*, and true that *Some peanuts are salty*, and true that *All peanuts are salty* and, finally, of course, false that *Not all peanuts are salty*.
13. If it is true that *No question is unimportant*, then it is false that *Every question is unimportant* and false that *Some questions are unimportant*.
14. If I am not sure it is false that *No A is B*, but am sure it is false that *Some A is not B*, I should be certain it is false that *No A is B*.
15. It has been said, truly, that *Many brave hearts are asleep in the deep*. Hence it is true that *Some brave hearts are not asleep in the deep*.

## Chapter Twelve

### OBVERSION OF PROPOSITIONS

■\X7E have seen, in the preceding chapter, how propositions are put into opposition with each other. We are now going to consider how opposed propositions can be made equivalent in meaning by altering the terms of the propositions.

This process or relation is known as “obversion” and, like opposition, is a property of the whole proposition. Obversion of propositions consists of making two opposed propositions equivalent in meaning or signification. This equivalence of opposed propositions is accomplished by adding a negative particle to the predicate of one of the propositions. For example, *Some men are veterans* and *Some men are not veterans* are opposed propositions. We relate these two propositions in obversion by adding a negative particle to the predicate of the second proposition, thus altering the second proposition to *Some men are not non-veterans*. The propositions *Some men are veterans* and *Some men are not non-veterans* remain opposed in so far as one is affirmative and the other is negative, but they become equivalent in meaning by the addition of the negative particle to the predicate of the second proposition.

Let us notice the difference between formal opposition of propositions, treated in the last chapter, and obversion of propositions, which we are now considering. Opposition of propositions changes the quality of the proposition (from affirmative to negative or from negative to affirmative) but keeps the same subject and the same predicate in both propositions. Obversion of propositions also changes the quality of the propositions but, in addition, alters the predicate of the second proposition by adding a negative particle. Obversion of propositions, therefore, is not strict or formal opposition, since the changing of the predicate violates one of the conditions of opposition.

We shall consider only the obversion or equivalence of contrary

propositions and of sub-contrary propositions. The obversion of contradictory propositions and of propositions in subalternation is not readily applicable in English, nor is it of any practical use.

### THE RULES OF OBVERSION

#### 1. *Change the quality of the proposition*

A change of the quality of propositions is a change from an affirmative to a negative proposition, or from a negative to an affirmative proposition. Thus, if we have an affirmative copula in a proposition, then its obverted form must have a negative copula. If, however, we start with a proposition having a negative copula, then its obverted form must have an affirmative copula.

#### 2. *Negate the predicate*

If a proposition has a positive term as the predicate, then its obverted form must have a negative particle before the same predicate. If, however, a proposition has a negative predicate, then its obverted form must have a double negation before the same predicate. This double negation has the effect of making the predicate of the obverted proposition positive again.

Let us take some examples of obversion of propositions and see how the rules apply. We shall take, first, a proposition using only letters or symbols, for example, *Every A is B*. To obtain the obversion of this proposition, we simply apply the two rules. By changing the quality of the proposition, we go from an affirmative to a negative proposition. To negate the predicate, we add a negation to the predicate of the proposition. Thus we get: *No A is non-B*. If we change the letters of the propositions into words, we should have the following as an example: *Every voter is a citizen* obverted to *No voter is a non-citizen*.

In the second rule of obversion, it is important to remember that the negative sign is applied to the predicate and not to the copula. It is also important, in this connection, to distinguish between the negative sign *non* and the negative sign *not*. The negative sign *non* should always be used with a predicate or a subject of a proposition. The negative sign *not* should always be used with the copula.

It might seem desirable, sometimes, to use with the predicate such negative prefixes as *in* and *un*. For example, we might write an obversion as follows: *Every student is industrious* obverts to *No student is unindustrious*. The danger in this procedure is that sometimes such prefixes do not merely signify negations, but have a

certain intensive effect, which changes the original meaning of the predicate. For example, the word *unpatriotic* does not signify *non-patriotic* but a definite state contrary to that of patriotism. It is always safe and advisable, therefore, to use the negative particle *non* in making obversions.

It is well to recall that the correct form of the universal negative proposition is *No A is B*, and not *Every A is not B*, nor *Not all A is B*. The last two expressions signify particular negative propositions. Hence, the following obversion would not be valid (because of the change in quantity): *Every student is patriotic* to *Not every student is non-patriotic*.

If the original proposition is a universal negative proposition, for example, *No A is B*, we apply the two rules in the following way. We change the quality of the proposition from negative to affirmative. We negate the predicate of the affirmative proposition. Thus *No A is B* is obverted to *Every A is non-B*, or *No child is a voter* to *Every child is a non-voter*.

In particular propositions, we apply the two rules in the same way. We obvert *Some A is B* to *Some A is not non-B*. If the original proposition is negative, we obvert it to an affirmative proposition with a negated predicate, for instance, *Some A is not B* to *Some A is non-B*, or *Some students are not patriotic* to *Some students are non-patriotic*.

It is possible to start with a proposition that already has a negated predicate, for example, *Some students are non-veterans*. The first rule is applied, as before, by changing the proposition to a negative one. The second rule calls for negating the predicate. We could simply put another negative sign before the negated predicate, but since a negative sign destroys whatever follows it, one negative sign destroys the other, thus making the predicate positive. Hence, *Some students are non-veterans* is obverted to *Some students are not veterans*.

#### RULES OF TRUTH AND FALSITY IN OBVERSION

Since the relation of obversion makes the obverted proposition equivalent in meaning to the original proposition, the rules of truth and falsity are reduced to two. If the original proposition is true, the obverted proposition is true. If the original proposition is false, the obverted proposition is false.

We might add a final remark on the usefulness of obversion. As a logical relation, obversion is not very useful, since it merely restates the meaning of one proposition in another form. However, people often use obverted expressions, and since the meaning of an

obverted expression is not always clear, the process of obversion can be used to change the obverted expression back to its direct form. Thus, the obverted proposition *Some politicians are not non-partisan* can be changed by the process of obversion back to the direct form of *Some politicians are partisan*.

Furthermore, some persons think they can avoid being held to the truth of a proposition by putting it in the obverted form. For example, they might state that no politician is non-partisan without wanting to state that every politician is partisan. Nevertheless, as the rule of truth in obversion shows, the second proposition will have to be held as true if the first one is. In other words, in asserting that no politician is non-partisan they have committed themselves to the position that every politician is partisan.

There is an additional practical point to be made about obversion. Negative prefixes in propositions are frequently a source of confusion and misunderstanding as, for example, in *Some students are not non-veterans*. By the process of obversion an excess of negative signs can be lessened or even removed altogether. After we have examined conversion in the next chapter, we shall be able to remove all negative signs in a proposition by a combination of obversion and conversion.

#### QUESTIONS----CHAPTER TWELVE

1. Explain the meaning of "obversion."
2. How does obversion differ from opposition?
3. What are the rules of obversion? Illustrate with examples.
4. What are the rules of truth and falsity in obversion?
5. What practical applications has obversion?

EXERCISE I—CHAPTER TWELVE

Obvert the following propositions.

1. Some A is B. \_\_\_\_\_
2. Every A is B. \_\_\_\_\_
3. No A is non-B. \_\_\_\_\_
4. Some A is non-B. \_\_\_\_\_
5. Some A is not B. \_\_\_\_\_
6. No A is B. \_\_\_\_\_
7. Every non-A is non-B. \_\_\_\_\_
8. Every A is non-B. \_\_\_\_\_
9. No non-A is non-B. \_\_\_\_\_
10. Some non-A is B. \_\_\_\_\_

EXERCISE II—CHAPTER TWELVE

Restate in words each of the propositions in Exercise I. Then obvert each of the propositions.

Obvert the following propositions.

1. No soldiers are cowards.
2. Some trees are non-oaks.
3. Some non-freshmen are not veterans.
4. Every Christian is non-pagan.
5. Every non-voter is non-patriotic.
6. Some politicians are not non-statesmen.
7. Some man is artistic.
8. Some fruit is not sweet.
9. All books are interesting.
10. No non-logician is eligible.

## Chapter Thirteen

### CONVERSION OF PROPOSITIONS

CONVERSION of propositions consists of exchanging the subject and predicate while retaining the quality and truth. Conversion, then, is a reversing of the extremes of a proposition. For example, in the proposition *No man is a dog*, we exchange the subject and the predicate of the proposition, and obtain *No dog is a man*.

The conversion of propositions is the third property that follows upon the whole proposition. We have already treated the first two properties—opposition and obversion—in the two preceding chapters, and have distinguished them from each other. Let us now distinguish carefully between conversion and obversion.

In obversion, the obverted proposition is equivalent in meaning even though it is different in quality. In conversion, the subject and the predicate are interchanged, with the proposition always remaining the same in quality. Hence, when we convert an affirmative proposition, it will remain affirmative in the converted form. When we convert a negative proposition, it will remain negative in the converted form.

#### THE KINDS OF CONVERSION

##### 1. Simple conversion

Simple conversion is the exchange of subject and predicate in a proposition without any change in quantity. Thus, we convert a universal negative proposition *simply* and get the universal negative in the converted form. For example, *No stone is a rose* converts simply to *No rose is a stone*.

## 2. *Accidental conversion*

Accidental conversion is the exchange of subject and predicate in a proposition with a change in quantity. We convert a universal affirmative proposition *accidentally*, as in the conversion of *Every rose is a flower* to *Some flower is a rose*. It might seem as though we could convert a universal affirmative proposition simply, for example, *Every rose is a flower* to *Every flower is a rose*. There are two reasons why we cannot convert the universal affirmative proposition simply.

One reason is that the converted proposition is false, and obtaining a false proposition in conversion violates the definition of conversion. The definition states that the subject and predicate of a proposition are exchanged while retaining truth.

The second and more important reason why we cannot convert the universal affirmative proposition simply is that a fallacy is committed. In *Every rose is a flower*, the predicate *flower* is undistributed, because it is the predicate of an affirmative proposition. In the simple conversion of that proposition, the word *flower* becomes distributed, because it is now the subject of the universal proposition *Every flower is a rose*. We can never go from the undistributed to the distributed, that is, from the particular to the universal. Hence, the simple conversion of the universal affirmative proposition is always formally invalid.

Let us now summarize these points on conversion by stating the rules for the valid conversion of propositions.

### RULES OF CONVERSION

#### 1. *Every universal negative proposition converts simply*

Since the subject and the predicate of the universal negative proposition have the same distribution (the terms are both distributed), they can be exchanged simply. Hence, the universal negative proposition converts simply. *No dog is a horse* converts to *No horse is a dog*.

#### 2. *Every particular affirmative proposition converts simply*

Since the subject and the predicate of the particular affirmative proposition have the same distribution (the terms are both undistributed), they can be exchanged simply. Hence, the particular affirmative proposition converts simply. *Some diplomats are statesmen* converts to *Some statesmen are diplomats*.



3. *Every universal affirmative proposition converts accidentally*

In the universal affirmative proposition, the subject and the predicate do not have the same distribution, for the subject of a universal proposition is distributed, while the predicate of an affirmative proposition is undistributed. Hence, these terms cannot be exchanged simply. However, they can be exchanged accidentally, as we have seen, by changing the quantity of the proposition. In changing the proposition from universal to particular, we keep the predicate undistributed by making it the subject of a particular proposition. Thus, the universal affirmative proposition converts accidentally; for example, *Every rose is a flower* converts to *Some flower is a rose*.

We should notice that if a proposition predicates a definition or a property, as in *Every man is grammatical*, it could be converted simply in virtue of its matter, but not in virtue of its form. However, we are considering here conversion on the part of the form of the proposition. Formally considered, the universal affirmative proposition never converts simply.

4. *The particular negative proposition never converts validly*

The subject and the predicate of the particular negative proposition have different distribution. The subject is undistributed and the predicate is distributed. Consequently, if we exchanged the subject and the predicate of a particular negative proposition simply, we should again have an undistributed term becoming distributed. Thus, if we converted *Some animal is not man* to *Some man is not animal*, the term *animal*, which is undistributed in the first proposition, would be distributed in the second proposition.

Unlike the similar case of the universal affirmative proposition, we cannot eliminate this difficulty by accidental conversion—by a change in quantity. If we try to change the quantity, we can only change it to the universal negative, for we must keep the same quality in conversion. Thus, we could try to convert *Some animal is not man* to *No man is animal*. But again, the term *animal*, which is undistributed in the original proposition, would be distributed in the converted proposition.

There is no way, consequently, to prevent the illicit transition from undistributed to distributed in the conversion of the particular negative proposition. For this reason, the particular negative proposition never converts validly. Sometimes, in virtue of the matter, the conversion of a particular negative proposition results in a true proposition, as in the conversion of *Some men are not tall* to *Some tall (beings) are not*

*men*. However, the conversion is always formally invalid because of the illicit transition from undistributed to distributed.

#### RULE OF TRUTH IN CONVERSION

There is only one rule concerning truth and falsity in conversion of propositions: If the original proposition is true, the converted proposition will be true. No rule can be stated for the conversion of false propositions, because their conversion does not necessarily and immediately result in false propositions. For example, the conversion of a false universal affirmative proposition sometimes results in a true proposition, and at other times in a false one. The conversion of the false proposition *All flowers are yellow* is the true proposition *Some yellow things are flowers*. But the conversion of the false proposition *All flowers are trees* is the false proposition *Some trees are flowers*.

It is worth noticing, however, that false universal negative and false particular affirmative propositions are always false in their converted forms. This happens, not directly by conversion, but by a combination of opposition and conversion. For example, *Some horses are dogs* is a false proposition. But we know that its contradictory, *No horses are dogs*, is true. We can now convert this proposition to *No dogs are horses*, which is also true. We know, further, that the contradictory of this last true proposition is the false proposition *Some dogs are horses*, which is the converted form of the original false proposition *Some horses are dogs*. By this combination of opposition and conversion, therefore, false universal negative and false particular affirmative propositions are shown to be false in their converted form.

The principal use of conversion is found in the study of the syllogism. As we shall see, in the chapter on the reduction of syllogisms to the first figure, conversion is used there to change some less evident forms of the syllogism to more evident forms.

We can also use conversion, combined with obversion, to remove negative signs and prefixes from propositions so as to make them clearer in meaning and in structure. For example, consider a proposition in such complicated structure as *Every non-veteran is a non-student*. It is difficult to tell just what this proposition is asserting. However, we can obvert it to *No non-veteran is a student*. Then we can convert it to *No student is a non-veteran*. To get rid of the last negative sign, we can obvert the last proposition to *Every student is a veteran*. *Every student is a veteran* is simple and clear in meaning, compared with *Every non-veteran is a non-student*.

There is a final, practical use of conversion. A knowledge of valid conversion helps us eliminate the frequent tendency we have of em-

playing invalidly converted propositions. We easily fall into the error of supposing that the universal affirmative proposition converts simply. For example, if someone thinks it is true that every intelligent person has a high forehead, he is likely to think it is also true that every person with a high forehead is intelligent. However, we know, through the rules of conversion, that the universal affirmative proposition converts only accidentally.

**QUESTIONS----CHAPTER THIRTEEN**

1. What does the conversion of propositions mean?
2. How does conversion differ from obversion?
3. How does conversion differ from opposition?
4. What are the kinds of conversion?
5. Why can we not convert the universal affirmative proposition simply?
6. Why can we never convert the particular negative proposition validly?
7. What are the rules of conversion? Illustrate each rule.
8. What are the uses of conversion?



EXERCISE I—CHAPTER THIRTEEN

Convert the following propositions.

1. Every A is B. \_\_\_\_\_
2. Some A is B. \_\_\_\_\_
3. No A is B. \_\_\_\_\_
4. Some A is non-B. \_\_\_\_\_
5. Every non-A is non-B. \_\_\_\_\_
6. No non-A is B. \_\_\_\_\_
7. Every A is non-B. \_\_\_\_\_
8. Some non-A is B. \_\_\_\_\_

EXERCISE II—CHAPTER THIRTEEN

Restate in words each of the propositions in Exercise I. Then convert each of them.

*EXERCISE III—CHAPTER THIRTEEN*

Convert the following propositions.

1. Some students are intelligent.
2. No square is a circle.
3. Every oak is a tree.
4. Some non-seniors are ineligible.
5. All pagans are non-Christians.
6. James hit John.
7. All voters are citizens.
8. Some trees have leaves.
9. No non-alien is a citizen.
10. No supporter of democracy believes in the tyranny of totalitarian government.

# FIFTEEN

The statements in the exercise should be worked out as follows. Determine first what types of relation (opposition, obversion, conversion, or some combination) are in the statement. Then determine whether the rules of truth and falsity are followed. The whole statement is valid only if each proposition (except those propositions preceded by if) follows validly from *any* preceding proposition.

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8. *No dogs are allowed.* Hence, *Non-dogs are allowed.* Hence, *Cats are allowed.*
9. If it is false that *Some students are honest*, then it must be true that *Some students are not honest.*
10. If I know it is true that *Some freshmen are intelligent students*, then it is false that *No intelligent students are freshmen*, and false that *All freshmen are not intelligent students.*
11. If *Some A is non-B* is false, then *Some A is not B* is false, and *No A is B* is false, and *Every A is non-B* is false, and *Every A is B* is true, and *Some B is A* is true, and *Some B is not A* is true.
12. If I know that it is true that *No non-veteran is an alien*, then I know that it is true that *Every non-veteran is a non-alien*, but I do not know whether it is true that *Some non-alien is a veteran.*
13. Paul, a promising student in logic, declares that it is false that *Some flowers are trees.* He also declares that there is no way, in which he can determine the falsity of the proposition *No trees are flowers.*
14. Henry, an unpromising student in logic, made up the following statement: If it is true that *No gnat is a bat*, then it is true that *No bat is a gnat*, and true that *Every bat is a non-gnat*, and true that *Some bat is a non-gnat*, and true that *Some bat is not a gnat*, and true that *Some gnat is not a bat*, and false that *Some non-bat is not a non-gnat.*
15. Take the following proposition as false: *Some eggs are doughnuts.* Obvert it. Then contradict it. Then convert it. Then contradict it. Then obvert it. You now have
16. Take the following proposition as false: *Some ravens are ducks.* Can you, by valid relations of opposition, obversion, or conversion, arrive at *No non-ducks are ravens* as false? \_\_\_\_\_



## Chapter Fourteen

# THE COMPOUND PROPOSITION

IN the divisions of the proposition in Chapter Nine, we first divided the proposition, according to unity into categorical and compound. We shall now investigate the compound proposition further and specify its kinds.

As we have already seen, a compound proposition is one by conjunction, because it signifies a complex composition in the intellect. The compound proposition, accordingly, has a connective as its copula, uniting categorical propositions as parts of the compound proposition. The proposition *If horses are animals, then horses have sensation* is a compound proposition; the connectives *if . . . then* serve to unite the categorical propositions “horses are animals” and “horses have sensation.”

The compound proposition is divided, first, into explicitly and implicitly compound propositions. An explicitly compound proposition is one whose complex composition is fully revealed in the expression of the proposition, as in the example just given. An implicitly compound proposition is one that appears to be a categorical proposition but is actually a disguised compound proposition, capable of being resolved into two or more propositions. Implicitly compound propositions are sometimes called “exponibles,” that is, propositions that can be exposed. For example, the proposition *God alone is eternal* appears to be a categorical proposition. In reality, the proposition is implicitly compound, because it signifies a complex composition in the intellect. It can be resolved into two propositions, *God is eternal*, and *No other is eternal*. The word “alone” is the key word. It signifies the implicitly complex composition of the proposition. All implicitly compound propositions will have some key word signifying the complex composition.

## EXPLICITLY COMPOUND PROPOSITIONS

1. *The conditional proposition*

A conditional proposition is a compound proposition in which two or more categorical propositions are joined by the connectives *if . . . then*. Sometimes only the *if* is stated, with *then* presupposed. For example, *If a stone is a body, it has weight* is a conditional proposition. The first part of the conditional proposition (the *if* part) is called the “antecedent.” The last part of the conditional proposition (the *then* part) is called the “consequent.” The relation of the two parts of the conditional proposition is called the “sequence.”

The truth of a conditional proposition requires that the sequence be good, that is, valid. If the sequence is bad or invalid, the conditional proposition is false. Hence, in a true conditional propositions the second proposition must necessarily follow from the first. If the second proposition does not have a necessary relation with the first, then the conditional proposition is not true.

We might recall that we have been using the conditional proposition in the Square of Opposition. We said, for example, *If A is true, then I is true*. Now this is a true conditional proposition. If we had said *If I is true, then O is true*, this would have been a false conditional proposition, because the second proposition does not follow necessarily from the first.

Consequently, in the conditional proposition, it does not matter whether the categorical propositions composing it are true or false. All that matters is that the consequent, the second part of the proposition, follow necessarily from the antecedent, the first part of the proposition. Hence, the following conditional proposition, *If man is a dog, then man barks* is a true conditional proposition even though the two categorical propositions composing it are false.

2. *Copulative proposition*

A copulative proposition is a compound proposition in which two or more categorical propositions are joined by a connective such as *and*. Thus, *Peter is a doctor and Paul is a lawyer* is a copulative proposition, as is also the shortened form, *Peter and Paul are students*. However, the proposition *Peter and Paul are cousins* is not a copulative proposition, but a categorical proposition, for the supposition of the predicate in this proposition requires that *Peter and Paul* together form the subject.

For a copulative proposition to be true, all the categorical propositions composing it must be true. If any one of the composing cate-

gorical propositions is false, then the whole copulative proposition is false. Thus, *The wise conserve and the foolish dissipate* is a true copulative proposition because each categorical proposition is true. If one or both of the categorical propositions are false, the copulative proposition is false, as in *Man is an animal and man has wings*.

The copulative proposition is only a material connection of categorical propositions. It presents no formal relation of propositions, such as the conditional proposition. Its value depends solely upon the truth of its joined parts. The usual true-false test employs the copulative type of proposition, and hence the rule of truth for the copulative proposition (A statement is not true unless all its parts are true.) is followed in such a test.

### 3. *The disjunctive proposition*

A disjunctive proposition is a compound proposition in which categorical propositions are joined by the connectives *either . . . or*. Sometimes *or* alone is used, with *either* presupposed. Thus, *Either a student passes a course or he does not pass a course* is a disjunctive proposition. *The window is open or shut* is also a disjunctive proposition.

A strict or proper disjunctive proposition asserts that one and only one part of the proposition can be true, as in the examples given. A loose or improper disjunctive proposition asserts that one part of the proposition must be true whether the other parts are true or not, as in *James or John or Henry is coming*.

## IMPLICITLY COMPOUND PROPOSITIONS (ex PONIBLES)

### 1. *The exclusive proposition*

The exclusive proposition is one that contains such particles as *alone* and *only*. These exclusive particles qualify either the subject or the predicate of the proposition. We have already mentioned *God alone is eternal* as an example. We can resolve this into *God is eternal and Nothing other than God is eternal*, or simply, *No other is eternal*. In resolving the exclusive proposition, there will always be two explicit propositions: one will affirm that the predicate belongs to the subject; the other will deny that the predicate belongs to any other subject. This is all contained implicitly in the signification of the particle *only* or *alone*.

Let us take another example: *Only students are freshmen*. This will be resolved into *Students are freshmen and None other than students are freshmen*. We can, however, state this resolution more

simply as follows: *Students are freshmen* and *All freshmen are students*. We can do this because *None other than students are freshmen* is equivalent to *All freshmen are students* by a combination of obversion and conversion. First of all, *None other than students are freshmen* is the same as *No non-students are freshmen*. *No non-students are freshmen* can be converted to *No freshmen are non-students*, which is then obverted to *All freshmen are students*. Consequently, while the exclusive proposition is resolved directly into an affirmative and a negative proposition, it can also be resolved more evidently into two affirmative propositions. It is more evident to resolve *Only A is B* into *A is B* and *Every B is A* than into *A is B* and *None other than A is B*.

## 2. *The exceptive proposition*

The exceptive proposition is one that contains such particles as *except* and *unless*. In the exceptive proposition, something contained under the subject is excluded from the predicate. Thus, *Every student except John passed the examination* is an exceptive proposition. We can resolve this into: *Every student other than John passed the test*, *John is a student* and *John did not pass the test*. If, however, the proposition were *Every student except one passed the test*, it would be resolved to: *One student did not pass the test*, and *Every other student passed the test*. In this case, the word "one" could only refer to "student," and hence there is no third proposition.

## 3. *The reduplicative proposition*

The reduplicative proposition is one that contains such particles as *as*, *inasmuch as*, *as such*, and so forth. These particles or connectives qualify the subject; they modify or restrict the subject. Thus, *Man as an animal is mortal* is reduplicative. It resolves into the following propositions: *Man is an animal*, and *As animal, he is mortal*.

## THE TRUTH OF EXPONIBLES

The rule for the truth of implicitly compound propositions is the same as the rule for the truth of copulative propositions, since they are resolved into copulative propositions. Hence, the implicitly compound proposition is true only if every exponible is true. It is important to be sure that all the propositions are resolved and true before judging that the implicitly compound proposition itself is true.

## QUESTIONS---CHAPTER FOURTEEN

1. What kind of unity does a compound proposition have? Why?
2. What kind of copula does the compound proposition have?
3. What is the major division of compound propositions? Explain each member of the division.
4. What is a conditional proposition?
5. When is a conditional proposition true or valid?
6. What do we mean by the "antecedent," "consequent," and "sequence" in the conditional proposition?
7. What is a copulative proposition?
8. When is a copulative proposition true?
9. What is a disjunctive proposition?
10. Distinguish between a strict disjunctive proposition and a loose disjunctive proposition.
11. What is an exclusive proposition?
12. Justify the following process. *Only A is B* is resolved into *(Some) A is B* and *Every B is A*.
13. What is an exceptive proposition? Illustrate with an example.
14. What is a reduplicative proposition? Illustrate with an example.
15. What is the rule of truth for exponible propositions?



*Part Three*

*THE* THIRD ACT OF THE INTELLECT;  
REASONING







## Chapter Fifteen

### ARGUMENTATION

As we start Part Three, it may be well to refer again to the  $\neg\wedge$ -order of logic and indicate what we are to consider in this last part. As we saw in the Introduction, logic is the art that guides us in coming to know the unknown from what is previously known. An unknown object is either simple, as *tree*, *man*, or *redness*, or complex, as *Man is artistic*. A simple object is known by the first act of the intellect, the act of simple apprehension. The simple object is most perfectly manifested in a definition. We have covered this in Part One.

A complex object is made known by means of *argumentation*. Argumentation requires two additional acts of the intellect: the act of composition or division, and the act of reasoning. The act of composition or division is the second act of the intellect, and we have treated this in Part Two of logic. Having considered the proposition, its various kinds and properties, we can now proceed to the third act of the intellect—reasoning. Reasoning is needed to manifest fully an unknown complex object. We shall now treat reasoning and especially the syllogism, which is the perfect type of argumentation.

An argumentation is a process of reasoning. In the act of reasoning, as distinct from the other acts of the intellect, we acquire knowledge of a new truth by means of truths already known. Some truths are obtained independently, some in subordination to others. We obtain truths independently of each other by composition or division, that is, by composing a predicate with a subject or by dividing a predicate from a subject, as in the second act of the intellect.

Other truths are obtained from truths subordinated to each other. In the reasoning process, the third act of the intellect, we arrive at a new truth by relating and subordinating several truths. For example, we can say *Every animal is mortal* and *Every human being is an animal*. By relating these two truths or propositions to each other and by

subordinating the second proposition to the first, we arrive at a new truth, *Every human being is mortal*. This subordination is according to the universality of the propositions, not according to their greater or lesser importance. Reasoning consists essentially in this movement from one truth to another, that is, in discursive operation. We call the third truth a “new” truth because we know it as true by means of the two previously known truths.

An argumentation is defined as *a composite expression in which, one thing being given, another follows*. In the example in the preceding paragraph, the first two truths constitute something as given, and the third truth follows from them. That which is given is called the *antecedent*; that which follows is called the *consequent*.

In the example used, the first two truths constitute the antecedent in such a way that one of the truths is subordinated to the other. The subordinated truth is the second proposition, *Every human being is an animal*. It is the subordinated proposition because it is lesser in universality than the first proposition. *Every animal is mortal* is the first proposition, to which the second is subordinated, because the first is greater in universality. The third proposition, which follows from the other two as a conclusion from them, is the consequent. The consequent concludes the act of reasoning. The full argumentation, in terms of antecedent and consequent, is the following:

Every animal is mortal.	} { <i>antecedent</i> }
Every human being is an animal.	
Every human being is mortal.	

We also speak of the act of reasoning as an act of inference. Inference is the act of passing from the antecedent to the consequent. Hence we speak of inferring the consequent from the antecedent, or the conclusion from premises.

An inference (or sequence) may be valid or invalid. A valid inference occurs when the antecedent really infers the consequent, that is, when there is a real connection and dependence of the consequent upon the antecedent. An invalid inference occurs when the antecedent only appears to infer the consequent, that is, when there is no real connection and no dependence of the consequent upon the antecedent. We shall examine later when an inference is valid or invalid.

We can, however, state certain general principles of argumentation. First, *a false consequent cannot follow from a true antecedent*. The reason for this is that the consequent is contained implicitly within the antecedent, and hence, if the antecedent is true, the consequent inferred from it will have to be true. However, a *true consequent*

*may follow from a false antecedent.* This does not mean that a false antecedent causes a true consequent precisely as the consequent is true but, rather, that a true consequent can be accidentally connected with a false antecedent. In other words, a false antecedent can cause a consequent to follow, but cannot cause the consequent to follow as true. For example, the antecedent *Every flower is an animal* and *Every dog is a flower*—a false antecedent—causes the consequent *Every dog is an animal* to follow, but does not cause that consequent to follow as true, that is, the antecedent is not the cause of the truth of the consequent.

There are two kinds of argumentation: deductive and inductive. Deductive argumentation is the same as the syllogism. We have been using a syllogism as an example of argumentation. It should be emphasized that deductive argumentation, or the syllogism, proceeds properly from the more universal to the less universal; the syllogism, therefore, properly remains on the plane of universality. The example we have been using makes this clear.

Every animal is mortal.	(more universal)
Every human being is an animal.	(less universal)
Therefore, every human being is mortal,	(conclusion)

Inductive argumentation, which is the same as induction, *proceeds from singulars to the universal*. Induction proves that a characteristic belongs to a common subject by producing corresponding singulars. For example, we argue from the fact that this man is capable of speech, and another man is capable of speech, and so of all individual men, to the universal *Every man is capable of speech*.

Let us now consider argumentation in detail. We shall treat the syllogism at some length, because it is the perfect type of argumentation. Induction, the second and less perfect type of argumentation, will be considered after the syllogism.

#### QUESTIONS---CHAPTER FIFTEEN

1. State the order of the three parts of logic and the relation of the third part to the other two.
2. How does the act of reasoning differ from the other acts of the intellect?
3. What do we mean by arriving at a "new" truth in the act of reasoning?
4. What is an argumentation?
5. Explain the antecedent and the consequent of an argumentation. Illustrate with an example.
6. What is meant by "inference"?
7. When is an inference valid? When is it invalid?
8. Why cannot a false consequent follow from a true antecedent?
9. How can a true consequent follow from a false antecedent?

10. What are the two kinds of argumentation? Define each kind.
11. Deduction has sometimes been defined as that which proceeds from the universal to the singular. Criticize this definition.
12. Illustrate an inductive argumentation with an original example, and show how it exemplifies the meaning of induction.

## Chapter Sixteen

### THE SYLLOGISM

A syllogism, most simply defined, is *a composite expression in which, certain things being given, something else necessarily follows*. The syllogism is here defined as argumentation, for, as we have mentioned, the syllogism is the perfect type of argumentation. We can expand this definition in the following way: The syllogism is an argumentation in which two propositions, as the antecedent, unite two terms with a third or middle term, from which a third proposition, as the consequent, is inferred necessarily.

Let us take the following as an example of a syllogism.

Every animal is a substance.  
Every dog is an animal.  
Therefore, every dog is a substance.

In the antecedent, the terms *dog* and *substance* are the two terms that are united with the third, or middle, term *animal*. In the consequent, the two terms *dog* and *substance* are united with each other because of their union with the middle term.

#### THE MATTER OF THE SYLLOGISM

We distinguish between the proximate matter and the remote matter of the syllogism.

The three propositions of the syllogism constitute the proximate matter. The first two propositions of the syllogism are called the “premises,” that is, propositions leading to a conclusion. The third proposition of the syllogism is called the “conclusion.” The word “therefore” introduces the conclusion, as a sign of the inference.

The premises are divided into major and minor. The major premise has the predicate of the conclusion appearing in it. The minor premise has the subject of the conclusion appearing in it.

The reason why the premise which contains the predicate of the conclusion is called the major premise is that the predicate of the conclusion is taken as greater in universality than the subject. For this reason the predicate of the conclusion, as it appears in the major premise, is called the "major extreme." The other premise is called the minor premise because it contains the subject of the conclusion, which is taken as less universal than the predicate of the conclusion. Hence the subject of the conclusion, as it appears in the minor premise, is called the "minor extreme." Now with this terminology added, let us look again at the syllogism we have given.

	(major extreme)	
Every animal is a substance.		(major premise')
(minor extreme)		
Every dog is an animal.		(minor premise)
	(minor)	(major)
Therefore, every dog is a substance		(conclusion)

The syllogistic terms constitute the remote matter of the syllogism. A syllogistic term is the *subject or predicate into which the proposition is resolved*. The copula is not one of the syllogistic terms; it serves, rather, to connect them.

The syllogistic terms, accordingly, are the *major*, the *minor*, and the *middle* term. Each of these terms appears twice, and no more than twice, in a syllogism. As we have seen, the term standing as the predicate of the conclusion and appearing in the major premise is the major term or extreme. The term standing as the subject of the conclusion and appearing in the minor premise is the minor term. The term found in each of the premises, uniting the major and minor terms, is the middle term. The middle term has two functions. (1) It is the link between the major and minor terms. (2) It is the term that is middle in universality and in position in the premises.

Using the letters *M* to symbolize the middle term, *s* to symbolize the subject of the conclusion, the minor term, and *P* to symbolize the predicate of the conclusion, the major term, let us repeat the syllogism.

Every animal is a substance.	(M A P)
Every dog is an animal.	(S A M)
Therefore, every dog is a substance.	(S A P)

The letter *A* stands for a universal affirmative proposition. Recall that the major premise is defined as the one having the predicate of the conclusion in it, and that the minor premise is defined as the one having the subject of the conclusion in it. These definitions indicate the order to look for in examining a syllogism. The logical order of reasoning demands that the major premise should appear

first in the syllogism, even though occasionally we find syllogisms in which the minor premise is first. Hence, when analyzing the structure of a syllogism, the conclusion should be examined first in order to determine the major term (the predicate of the conclusion) and the minor term (the subject of the conclusion). From this, we can determine which premise is the major premise and which the minor.

### THE FORM OF THE SYLLOGISM

The form of the syllogism is constituted by mood and figure.

The mood of a syllogism is the disposition of the propositions of the syllogism (1) according to quality—affirmative and negative—and (2) according to quantity—universal and particular. For example, if we have a syllogism composed of three universal affirmative propositions, the mood of the syllogism will be wholly universal affirmative, or, as expressed by symbols,  $A-A-A$ .

It is evident that we can have a variety of moods in a syllogism, depending upon the quality and the quantity of the propositions making up the syllogism. Thus, we can have  $A-A-A$  as a mood, or  $E-A-E$ , or  $I-A-I$ , or  $E-I-O$ , and so forth. As we shall see later, only certain moods are valid in a syllogism. When giving the mood alone, without adding the syllogistic terms, we shall always presuppose the logical order of reasoning: major premise, minor premise, and conclusion. Hence, the mood  $E-I-O$  means that the major premise is a universal negative proposition, the minor premise is a particular affirmative, and the conclusion is a particular negative.

The figure of a syllogism is the disposition of terms in the syllogism. Since the middle term appears twice in the premises, the figures of the syllogism are derived from the various possible locations of the middle term in relation to the major and minor terms.

For example, we can relate the three terms of a syllogism in such a way that the major is affirmed or denied of the middle, and the middle is affirmed or denied of the minor. In this way, we obtain the *first* figure of the syllogism. Thus, let the major term be *organism*, the middle term *animal*, and the minor term *man*. By affirming the major term of the middle, we get:

Every animal is an organism.

By affirming the middle term of the minor, we get:

Every man is an animal.

From these two premises, we get as a conclusion:

Every man is an organism.

In symbols, we get the following disposition of terms, which constitutes the first figure:

$$\begin{array}{l} M - P \\ S - M \\ S - P \end{array}$$

Consequently, when the middle term stands as the subject of the major premise and the predicate of the minor premise, we have the first figure of the syllogism. The first figure of the syllogism is called the *perfect* figure, because in this disposition of terms, the middle term is middle in universality and has the middle position in the premises. As subject of the major premise and predicate of the minor premise, the middle term clearly stands between the major and minor extremes. In this figure, the position of the major extreme is the position of greatest universality and that of the minor the position of least universality. The first figure is thus the figure most evident to us.

However, we can have other dispositions of terms in a syllogism. The middle term can be affirmed or denied of both the major term and the minor term. The middle term thus stands as the predicate of both premises. Thus, let *animal* be the middle term, *stone* the major term, and *horse* the minor term. By denying *animal* of *stone* we get:

No stone is an animal.

By affirming *animal* of *horse* we get:

Every horse is an animal.

From these two premises, we get as a conclusion:

No horse is a stone.

In symbols, we get the following disposition of terms, which constitutes the *second*, figure of the syllogism:

$$\begin{array}{l} P - M \\ S - M \\ S - P \end{array}$$

Notice, in this disposition of terms, that the predicate of the conclusion stands as the subject of the major premise. The appearance of the symbol *P* in the *subject* position of the major premise ( $P - M$ ) is necessitated by the middle term's being in the predicate position of both premises. Hence, the predicate of the conclusion will have to



appear in the subject position of the major premise. For this reason, and particularly because the middle term does not occupy the middle position, the second figure is less evident and less perfect than the first figure.

We can have still another disposition of terms in a syllogism. Both the major and minor terms can be affirmed or denied of the middle term. The middle term thus stands as the subject of both premises, and the major and the minor as the predicates. Thus, let *tree* be the middle term, *green* the major term, and *plant* the minor term. By affirming *green of tree*, we get:

Some tree is green.

By affirming *plant of tree* we get:

Every tree is a plant.

From these two premises, we get as a conclusion:

Some plant is green.

In symbols, we get the following disposition of terms, which constitutes the *third* figure of the syllogism:

$$\begin{array}{l} M - P \\ M - S \\ S - P \end{array}$$

Notice, in this disposition of terms, that the subject of the conclusion stands as the predicate of the minor premise. The appearance of the symbol *S* in the *predicate* position of the minor premise is necessitated by the middle term's being the subject of both premises. Hence, the subject of the conclusion will have to appear in the predicate position of the minor premise. Here, again, the middle term does not occupy the middle position, and hence the third figure, like the second figure, is less evident and less perfect than the first figure.

It might seem as though there could be a fourth figure of the syllogism, as though we could arrange the terms in such a way that the middle term could be put in the predicate position of the major premise and in the subject position of the minor premise, as follows:

$$\begin{array}{l} P - M \\ M - S \\ S - P \end{array}$$

With words, we should have something like the following:

Every man is an animal.  
 Every animal is a substance.  
 Therefore, some substance is a man.

Galen, a logician of the second century a.d., is reputed to have introduced such a disposition of terms into the syllogism and to have called it the fourth figure. It is frequently given as a fourth figure at the present time.

However, the so-called fourth figure is not a legitimate figure of the syllogism. To appreciate this point, let us recall that a syllogism should represent an order of judgment that proceeds from the more universal to the less universal. The so-called fourth figure inverts this order of judgment by having its major term less universal than its minor term. Furthermore, the so-called fourth figure has its middle term put in the position of the most universal extreme in the major premise and in the position of the least universal extreme in the minor premise. Putting the middle term in these positions is contrary to the very notion of a middle term.

We can conclude, therefore, that the so-called fourth figure has no meaning as a *syllogistic* figure. Let us also mention here that the so-called fourth figure should not be confused with the first figure when it concludes indirectly, which we shall consider at the end of the next chapter.

#### QUESTIONS----CHAPTER SIXTEEN

1. What is the definition of a syllogism?
2. Expand the definition of the syllogism, giving an original example.
3. What are the antecedent and the consequent of a syllogism?
4. What is the proximate matter of the syllogism?
5. Is every proposition a premise? Explain.
6. Distinguish between the major and the minor premise.
7. What is a major extreme? What is a minor extreme?
8. What is the remote matter of a syllogism?
9. What are the syllogistic terms?
10. How do we tell which is the major premise of a syllogism?
11. What is meant by the "mood" of the syllogism?
12. What is meant by the "figure" of the syllogism?
13. How are the terms of a syllogism arranged in the first figure of a syllogism?
14. Construct a syllogism in the first figure, using the mood *E-A-E*, with *x* as the middle term, *y* as the minor term, and *z* as the major term.
15. Why is the first figure called the "perfect" figure?
16. How are the terms of a syllogism arranged in the second figure of the syllogism?

17. Construct a syllogism in the second figure, using the mood *E-I-O*, with *X* as the middle term, *Y* as the minor term, and *Z* as the major term.
18. How are the terms of a syllogism arranged in the third figure?
19. Construct a syllogism in the third figure, using the mood *I-A-I*, with *x* as the middle term, *y* as the minor term, and *z* as the major term.
20. Why is the so-called fourth figure not a legitimate syllogistic figure?



## Chapter Seventeen

# PRINCIPLES AND RULES OF THE SYLLOGISM

IN the preceding chapter, we considered the definition of the syllogism, and its matter and form. We shall now examine the syllogism from the standpoint of validity, that is, determine when the various moods of the syllogism are valid in the different figures. We want to know, in other words, when the form of syllogistic reasoning is valid apart from any specific matter, not by excluding all matter from the syllogism—for any syllogism must have its proximate and remote matter—but by analyzing the form of reasoning in the syllogism. For example, we shall determine whether the mood  $A-A-A$  is valid in all figures, or in none of the figures, or in some of them, and so with the other moods, regardless, for the time being, whether we are reasoning about God, man, or the elements.

First, however, we must note that the syllogism, as a kind of argumentation, rests on the possibility of truly predicating one thing of many; for unless we can use a universal in this way, we cannot have a middle term, and without the middle term we cannot have a syllogism. How can we conclude that  $C$  is  $A$  unless there is some middle term  $B$ , in which both  $C$  and  $A$  participate, that is to say, in which one of these terms is predicated of  $B$ , and  $B$ , in turn, is predicated of the other? In other words, why is  $A$  predicated of  $C$  ( $C$  is  $A$ )? Only because  $A$  is predicated of  $B$  and  $B$  is predicated of  $C$ .

Let us try to see why this is so by stating the fundamental principles upon which every syllogism rests.

### THE FUNDAMENTAL PRINCIPLES OF THE SYLLOGISM

The first principle of the syllogism is: *Two things that are the same with a third thing are the same with each other.* This principle is

evident as soon as its terms are understood, and is immediately reducible to the principle of contradiction: "A thing cannot both be and not be at the same time and in the same respect." We have already made use of this first principle in analyzing the syllogism, but we shall now consider it explicitly to see its full application.

This principle applies to the syllogism in the following way. The respect in which the subject and the predicate are united in the conclusion must be the same respect in which each is related to the third (middle) term in the premises. By "respect" we mean that the terms, especially the middle term, must be the same in *reality* and in *reason*, that is, one and the same nature in reality must be represented by the terms, and the terms must keep the same signification and supposition. The following syllogism will exemplify this point.

Every animal is mortal.  
Every dog is an animal.  
Therefore, every dog is mortal.

The conclusion *Every dog is mortal* follows precisely because *dog* and *mortal* are both united in the universal *animal*. The middle term *animal* is the reason why the conclusion follows. In other words, the identity or sameness of *mortal* with *dog* follows from the identity or sameness the middle term has in relation to each of the other two terms.

If a syllogism is proving a negative conclusion, the first principle of the syllogism is stated negatively in the following way: *Two things, one of which is the same, the other not the same, with a third thing, are different from each other.* The following syllogism illustrates the negative statement of the principle:

No tree is a mineral.  
Every oak is a tree.  
Therefore, no oak is a mineral.

The conclusion *No oak is a mineral* follows precisely because *tree*, the middle term, is predicated of *every oak*, but is not united in any way to *mineral*. Here, again, the middle term is the reason why the conclusion follows, for no oak can be a mineral if no tree, which includes oak, is a mineral.

This first principle is a common principle. The next two principles are particular applications of it. They state the relation of a universal to its inferiors, a relation every syllogism must presuppose in order to be valid.

The second principle of the syllogism is stated in the following way: *Whatever is affirmed universally of a subject or a whole is*

*affirmed of everything contained under that subject or whole.* This principle is traditionally known as the *dictum de omni* (that is, "said of all"). Thus, whatever is affirmed universally of *animal* (for example, *substance*) must be affirmed universally of everything contained under *animal*. Hence, since *Every animal is a substance*, then *Every dog is a substance*, for *dog* is contained under *animal*, of which *substance* has been affirmed universally.

The third principle of the syllogism is stated in the following way: *Whatever is denied universally of a subject or a whole is denied of everything contained under that subject or whole.* This principle is traditionally known as the *dictum de nullo* (that is, "said of none"). Thus, whatever is denied universally of *animal* (for example, *stone*) must be denied universally of everything contained under *animal*. Hence, since *No animal is a stone*, then *No dog is a stone*, for *dog* is contained under *animal*, of which *stone* has been denied universally. The principles *dictum de omni* and *dictum de nullo* are verifiable directly only in the first figure; this direct verification is another sign that the first figure of the syllogism is the perfect figure.

### THE RULES OF THE SYLLOGISM

The rules of the syllogism are based upon the fundamental principles of the syllogism. The rules help us to apply the fundamental principles more easily; they help us to determine what moods are valid in the three figures of the syllogism. Actually, if we were acute enough logically, we could determine the valid moods of the syllogism from the principles alone, for every deductive argument is valid in virtue of the fundamental principles. The task, however, is simplified by these rules of the syllogism, which we shall now consider.

#### 1. *A syllogism must have only three terms*

As we have seen, the terms of a syllogism are the major, minor, and middle. Since two terms are united with a middle term, and then are united with each other, each term appears twice in a syllogism. Each term, used twice, must have the same signification and the same kind of supposition; otherwise there will be the *fallacy of four terms*.

No one would suppose that the following example is a valid syllogism:

Every sophomore is a student.  
Every freshman is immature.  
Therefore, every freshman is a student.

In such an example, we obviously have the fallacy of four terms; in fact, we do not have a middle term at all. But the following example might seem to be a valid syllogism:

Animal is a genus.  
Man is an animal.  
Therefore, man is a genus.

But this example also has the fallacy of four terms, although it appears to have only three terms. The supposition of the middle term *animal* changes, for in the major premise, *animal* is used in simple supposition, while in the minor premise it is used in personal supposition. Hence this example really has four terms, and is therefore an invalid syllogism.

It is evident, also, from this first rule that the middle term can never appear in the conclusion. Since each term can appear only twice in a syllogism, and since the middle term must appear in both premises (otherwise it would not be a middle term), the middle term can never appear in the conclusion. This point is stated sometimes as a separate rule of the syllogism, but its connection with the first rule is close enough to warrant its being included in it. The following syllogism is invalid because of the presence of the middle term in the conclusion:

Every plant is an organism.  
No plant is a human being.  
Therefore, no human being is a plant.

2. *Any term distributed, in the conclusion must also be distributed in the premises*

As we have seen, the premises are the cause of the conclusion. As an effect, the conclusion cannot have more than is contained in the premises, which are its cause. If a term is distributed or universal in the conclusion, but is undistributed or particular in the premise then the effect is greater than its cause. This would be the fallacy of having more in the conclusion than there is in the premise. The following example violates the second rule of the syllogism:

Every senator is a citizen.  
No governor is a senator.  
Therefore, no governor is a citizen.

In this example, the term *citizen* in the conclusion is distributed, since the predicate of every negative proposition is distributed. But the term *citizen* is undistributed in the major premise, for the predicate



of every affirmative proposition is undistributed. Hence, the conclusion does not follow. (In other words, what is true of some citizens is not necessarily true of every citizen.)

It is important, at this point, to review the rules for distribution of terms in Chapter Ten. It is practically impossible to test the validity of a syllogism without knowing the rules for distributed and undistributed terms in a proposition.

3. *The middle term must be distributed at least once*

No relation can be established between the major and minor terms in the conclusion unless the middle term is distributed at least once in the premises. If the middle term were undistributed in both premises, some of the inferiors under the middle term might refer to the major term while others might refer to the minor term. In other words, no sameness would be established between the middle term and the other two terms in the premises, and hence no conclusion could follow. The following is an example of a syllogism in which the middle term is undistributed in both premises:

Every dog is an animal.  
Every cat is an animal.  
Therefore, every cat is a dog.

4. *From two negative premises, no conclusion follows*

This rule states such a direct application of the first principle of the syllogism that it hardly needs to be formulated. If a syllogism has two negative premises, then the premises explicitly deny any relation of sameness between the middle term and the other two terms. Since, then, the premises tell us nothing about the relation of the middle term with the major and minor, we cannot tell whether or not the major and minor are related to each other. Hence nothing can be proved from two negative premises, as the following example shows:

No plant is an animal.  
No man is a plant.  
Therefore, no man is an animal.

It might seem, to some, as though two negative premises should yield a negative conclusion. Suppose that someone were to argue: *No tree is a stone; no man is a tree; therefore, no man is a stone.* Does not this conclusion seem to follow as true? The conclusion, of course, is true, but its truth is not caused by the premises. Although it is true that no tree is a stone and true that no man is a tree, we have no

sameness established through the middle term by which we can *prove* that no man is a stone. However, we could prove the truth of *No man is a stone* by showing that something universally affirmed of *man* is universally denied of *stone*, as in the following:

No stone is an animal, (*animal* is not predicated of *stone*,)  
 Every man is an animal, (but *animal* is predicated of *man*,)  
 Therefore, no man is a stone, (therefore, *stone* is not predicated of *man*)

5. *The conclusion always follows the weaker part*

A particular proposition is called *weaker* in relation to a universal proposition. A negative proposition is called *weaker* in relation to an affirmative proposition.

Hence, if one premise is universal, and the other particular, the conclusion will always be particular. If one premise is affirmative, and the other negative, the conclusion will always be negative. If one premise is both particular and negative, the conclusion will always be both particular and negative. The following example violates this rule of the syllogism:

Some actor is handsome.  
 Every actor is a human being.  
 Therefore, every human being is handsome.

In practically all cases, a violation of this rule is also a violation of another rule of the syllogism. Thus, in addition to violating the rule on following the weaker part, the syllogism above has an undistributed minor term in the premise and a distributed minor term in the conclusion (that is, *human being* is the predicate of an affirmative proposition in the minor premise, and hence undistributed, and is the subject of a universal proposition in the conclusion, and hence distributed).

In addition to these five rules, sometimes the following rule is given: *From two particular premises, no conclusion follows.* While this is a handy rule to know for quick examination of a syllogism, it adds nothing to the rules already given. Every time a syllogism has two particular premises, either the middle term will be undistributed or else a term will be distributed in the conclusion and undistributed in the premises. Hence, this statement about two particular premises should not be formulated into a separate rule.

In the light of the principles and rules of the syllogism, we can now determine which moods are valid in the different figures of the syllogism. It is evident that in any one figure there are sixteen possible moods, or combinations of premises of different quality and quantity, from which a conclusion might be drawn:

AAAA	EEEE	I I I I	OOOO
AEIO	AEIO	AEIO	AEIO

Let us recall that *A* is to stand for the universal affirmative proposition; *E* for the universal negative; *I* for the particular affirmative; and *O* for the particular negative. The letters given in the columns above are to be read downwards, with the top letter standing for the major premise, and the bottom letter for the minor. Thus, the second column has *A* at the top and *E* at the bottom, and stands for a universal affirmative major premise and a universal negative minor premise.

A conclusion can be drawn validly from each of these combinations of premises only if no rule, and consequently no fundamental principle of the syllogism, is violated. Since there are three figures, with sixteen possible moods in each figure, there is a total of forty-eight possible moods. However, not all of these moods are valid. To determine which of these are valid, we shall examine the sixteen moods of the first figure, then the moods of the second figure, and, finally, the moods of the third figure, testing them with the principles and rules of the syllogism.

We shall determine which moods are valid in an exercise at the end of this chapter. As an introduction to this exercise, let us try working out a few of the moods now. Suppose that we want to determine whether the mood *E — A* is valid in the first figure. We know that the first letter stands for the major premise, the second for the minor premise, and that *E* stands for a universal negative proposition, *A* for a universal affirmative proposition. We shall use *S*, *P*, and *M* for the syllogistic terms. As we have seen, *S* stands for the subject of the conclusion, the minor term; *P* stands for the predicate of the conclusion, the major term; *M* stands for the middle term. Hence, we have the following:

No *M* is *P*. (E)  
Every *S* is *M*. (A)

The question now is: Can we validly get a conclusion from these two premises?

No *M* is *P*. (E)  
Every *S* is *M*. (A)  
Therefore ? (?)

First, let us refer to the fundamental principles of the syllogism to see whether a valid conclusion can be drawn from these premises. In the major premise, we are saying *No O M is P*. *P* is being separated from *M* and from whatever is included under *M*. In the minor premise, we are

saying *Every S is M*. *S* is included under *M*. But *P* is separated from *M* and from everything under *M*. Therefore, *P* is separated also from *S*:

No <i>M</i> is <i>P</i> .	( <i>P</i> is separated from <i>M</i> .)
Every <i>S</i> is <i>M</i> .	( <i>S</i> is included under <i>M</i> .)
Therefore, no <i>S</i> is <i>P</i> .	(Therefore, <i>P</i> is separated from <i>S</i> .)

We conclude, then, that *No S is P* can be drawn as a valid conclusion from a universal negative major premise, and a universal affirmative minor premise, in the first figure.

Showing the validity of a syllogism this way, through its fundamental principles, is the most intelligible way to make the reasoning process evident. We can also test the validity of a syllogism through the rules, which are applications of the principles. Let us now test the same syllogism with the rules:

No *M* is *P*.  
Every *S* is *M*.  
Therefore ?

Notice first that the major premise is negative. The fifth rule tells us that the conclusion always follows the weaker part. We recall that the negative proposition is weaker than the affirmative. We can, then, eliminate *A* and *I* propositions as possible conclusions, since they are affirmative. This leaves *E* and *O* propositions as possible conclusions. Since both premises are universal, and since we always want to prove as much as<sup>^</sup>possible, we should try an *E* conclusion:

No *M* is *P*.  
Every *S* is *M*.  
Therefore, no *S* is *P*.

As long as we are using symbols instead of words (emphasizing the form of the syllogism more than the matter), the first rule will never be violated, for we can always presuppose the same signification and supposition with the three symbols. We can eliminate, therefore, any consideration of the first rule.

The second rule states that any term distributed in the conclusion must also be distributed in the premises. The conclusion has two distributed terms (the subject of a universal proposition is always distributed, and the predicate of a negative proposition is always distributed). Hence, we shall have to check both the major and minor terms in the premises. The major term *P* is the predicate of a negative major premise and is, therefore, distributed. The minor term *S*

is the subject of a universal minor premise and is therefore also distributed. Hence, the second rule is observed.

The third rule states that the middle term must be distributed at least once. In the major premise, the middle term is the subject of a universal proposition, and hence is distributed. The third rule is thus satisfied. We might go on to observe that the middle term is undistributed in the minor premise, since the middle term stands as the predicate of an affirmative proposition. But this does not matter, since the rule only calls for the middle term to be distributed once, and the middle term is distributed in the major premise. If the middle term were also distributed in the minor premise, the rule would still be observed, since it only calls for the middle term to be distributed at least once; the rule does not exclude the distribution of the middle term in both premises.

The fourth rule states that no conclusion follows from two negative premises. The syllogism we are considering has only one negative premise, and hence the fourth rule is not violated.

The fifth rule states that the conclusion must follow the weaker part. As we noted in the beginning, this syllogism has a negative major premise, which is weaker than an affirmative premise. The conclusion of this syllogism is negative and is therefore following the weaker part. Hence, the fifth rule is satisfied.

Since all the rules of the syllogism are observed, we may conclude that the following mood is valid in the first figure of the syllogism:

No M is P.  
Every S is M.  
Therefore, no S is P.

We might add that it is not necessary to consider an *o* conclusion in this mood, for an *E* proposition, being universal, includes the *o* proposition, which is particular. We should always draw the stronger conclusion when we can.

Let us consider another mood, this time *A-A* in the second figure:

Every P is M.  
Every S is M.  
Therefore ?.

It is worth noticing at once that both the premises are affirmative. When a syllogism has two affirmative premises, a negative conclusion can never be validly obtained. Although no rule of the syllogism states this point explicitly, we know it indirectly from the rule that the conclusion always follows the weaker part. Since both premises are affirmative, there is no negative, that is, weaker, part for the con-

elusion to follow. Therefore, the conclusion will retain the strength of the premises—it will be affirmative. If we tried to draw a negative conclusion from two affirmative premises, we should always violate either the second or third rule of the syllogism. Hence, we can eliminate an *E* and an *O* proposition as possible valid conclusions. We have *A* and *I* propositions left as possibilities. Since both premises are universal, let us try an *A* conclusion:

Every P is M.  
Every S is M.  
Therefore, every S is P.

Here, again, we need not concern ourselves with the first rule of the syllogism, since we are using symbols, which retain the same signification and supposition. The second rule states that any term distributed in the conclusion must be distributed in the premises. In this syllogism, we see that only the subject of the conclusion is distributed (for it is the subject of a universal proposition; the predicate, being the predicate of an affirmative proposition, is undistributed). Hence, we need to check only the minor term *S* in its premise. This is also the subject of a universal proposition, and is therefore distributed. The second rule is thus satisfied.

The third rule states that the middle term must be distributed at least once. In the major premise, the middle term stands as the predicate of an affirmative proposition and is, therefore, undistributed. Consequently, we must check the middle term in the minor premise. But the middle term in the minor premise is also the predicate of an affirmative proposition and is, therefore, undistributed. Hence, the middle term in this syllogism is undistributed in both premises. The third rule of the syllogism is thus violated.

There is no point in continuing with the other rules of the syllogism, for the violation of one rule is enough to make the syllogism invalid. And it will be of no help to try an *I* proposition as the conclusion, for the middle term will still be undistributed in both premises. We have already eliminated *E* and *O* propositions as conclusions. We conclude, then, that *A* — *A* cannot yield a valid conclusion in the second figure.

Before proceeding to the questions and exercises at the end of the chapter, let us notice that some syllogisms can conclude indirectly. An indirect conclusion occurs when the major term appears as the subject of the conclusion and the minor term appears as the predicate, as in the following example:

Some texts are books.	(Some <i>M</i> is <i>P</i> .)
No novels are texts.	(No <i>S</i> is <i>M</i> .)
Therefore, some books are not novels.	(Therefore, some <i>P</i> is not <i>S</i> .)

In the first figure, the valid moods leading to an indirect conclusion are: *A-A-I*; *E-A-E*; *A-I-I*; *A-E-O*; and *I-E-O*. Of these five valid moods, the first three can be obtained by a direct conclusion in the first figure (*A-A-I* is included under *A-A-A*). In the first figure, then, there are really only two combinations of premises yielding an indirect conclusion:

Every *M* is *P*.  
 No *S* is *M*.  
 Therefore, some *P* is not *S*.

and

Some *M* is *P*.  
 No *S* is *M*.  
 Therefore, some *P* is not *S*.

These two moods are properly called the "indirect moods" of the first figure. No indirect mood of concluding constitutes a distinct figure, but is simply the consequence of a particular mood in a given figure. There are, therefore, indirect moods but not indirect figures. Their only value consists in obtaining a conclusion that could not be reached directly.

# QUESTIONS----CHAPTER SEVENTEEN

1. Upon what does the syllogism, as a type of argumentation, primarily rest?
2. Explain and illustrate the first principle of the syllogism.
3. Explain and illustrate the second and third principles of the syllogism.
4. What is the relation of the rules of the syllogism to the principles of the syllogism?
5. How do we commit the fallacy of four terms?
6. Why can we not have a term distributed in the conclusion when it is undistributed in the premise?
7. Why must the middle term be distributed at least once?
8. If I have as premises *No B is A* and *No C is B*, why does it not follow that *No C is A*?
9. When is one proposition "weaker" than another proposition?
10. Why is it not necessary to give as a rule that from two particular premises no conclusion follows? Illustrate.
11. Is the mood *A-O-O* valid in any figure?
12. Why is the mood *A-A-A* not valid in the second figure? Why not in the third figure?
13. Which mood is valid in all three figures?
14. State the special rules of the syllogism for each figure.





This is an exercise for determining the valid moods of the syllogism. In this exercise, first work out the conclusions to the combinations of premises for Figure I. These combinations are given with the major premise at the top and the minor premise at the bottom. The lines drawn at the bottom of the rows of letters separate the premises from the possible conclusions that can be obtained. Work out the combinations in the order given, that is, do *A-A* first, then *A-E*, then *A-I*, and so forth. If a conclusion can be validly drawn, put the letter standing for the kind of proposition (*A*, *E*, *I*, or *O*) underneath the combination of premises. If no conclusion can be validly drawn, leave the space blank. Do Figure II and Figure III in the same manner, observing the different disposition of terms for each figure.

After the valid moods have been determined for each figure, answer the two questions asked under each figure. The answers to these questions give the special rules of the syllogism, that is, rules that apply specifically to each figure.

Figure I

Recall where the middle term must be for Figure I.

AAAA	EEEE	I I I I	OOOO
AEIO	AEIO	AEIO	AEIO

After the valid moods have been determined, state what kind of proposition (universal, particular, affirmative or negative) must always appear:

- (a) as the major premise in Figure I
- (&) as the minor premise in Figure I

Figure II

Recall where the middle term must be for Figure II.

AAAA	EEEE	I I I I	OOOO
AEIO	AEIO	AEIO	AEIO

After the valid moods have been determined, state what kind of proposition must always appear:

- (a) as the major premise in Figure II
- (&) as one of the two premises in Figure II

Figure III

Recall where the middle term must be for Figure III.

AAAA	EEEE	I I I I	OOOO
AEIO	AEIO	AEIO	AEIO

After the valid moods have been determined, state what kind of proposition must always appear:

- (a) as the minor premise in Figure III
- (&) as a conclusion in Figure III



*EXERCISE II—CHAPTER SEVENTEEN*

Write in the conclusions to the following syllogisms when the conclusions can be obtained validly and directly. If no conclusion follows, draw a line, and state which rule is violated.

I. Every X is Y.

Some Z is X.

2. No X is Y.

Some Z is X.

3. Every X is Y.

Every X is Z.

4. No X is Y.

Some Z is Y.

5. Some Y is X.

No Z is Y.

6. No X is Z.

Some Y is not Z.

7. Every Y is X.

Some Z is X.

8. Some Z is not X.

Every Z is Y.

9. No Y is X.

Every Z is Y.

10. Some Y is not X.

Some Z is Y.

*EXERCISE III—CHAPTER SEVENTEEN*

Mark the following syllogisms valid or invalid. If the syllogism is invalid explain why or state the rule violated.

1. Every man is rational.  
Every man is vegetative.  
Therefore, every vegetative being is rational.
2. No tyrants are statesmen.  
Some men are tyrants.  
Therefore, some men are not statesmen.
3. No athletic person is an invalid.  
Some syllogisms are invalid.  
Therefore, some syllogisms are not athletic.
4. Every cow is an animal.  
No tree is a cow.  
Therefore, no tree is an animal.
5. Everything actual is knowable.  
God is actual.  
Therefore, God is knowable.
6. Everything infinite is imperfect.  
God is most perfect.  
Therefore, God is not infinite.
7. No plants think.  
All men think.  
Therefore, no men are plants.
8. Some students are not artistic.  
Some students are freshmen.  
Therefore, some freshmen are not artistic.

9. All tenors are talented.  
Not all singers are tenors.  
Therefore, not all singers are talented.
10. Some novels are entertaining.  
All novels are books.  
Therefore, some books are entertaining.
11. Whatever has a soul is alive.  
Some bodies are alive.  
Therefore, some bodies have souls.
12. Every biped is an animal.  
Every animal is mortal.  
Therefore, every biped is mortal.
13. Every tree is a substance.  
No tree is a stone.  
Therefore, no stone is a tree.
14. No substance is an accident.  
Every quantity is an accident.  
Therefore, no quantity is a substance.
15. Every premise is a composite expression.  
Every premise is a proposition.  
Therefore, every proposition is a composite expression.
16. Some trees are not oaks.  
All elms are trees.  
Therefore, no elms are oaks.

EXERCISE IV—CHAPTER SEVENTEEN

Consider the following propositions as *conclusions*. Construct premises to prove them *validly* in any figure.

1. Every tree is a substance.
2. Some men are not composers.
3. No man is an ape.
4. Some food is fattening.
5. Not every man is honest.

EXERCISE V—CHAPTER SEVENTEEN

Consider the following propositions as either a major premise or a minor premise. Supply the other premise and draw valid conclusions from them.

1. Some student is not polite.
2. No saint is a sinner.
3. Some men are just.
4. Every poet is an artist.
5. Some wars are not justified.



## Chapter Eighteen

# REDUCTION OF SYLLOGISMS TO THE FIRST FIGURE

IN the preceding chapter we emphasized that the first figure is the perfect figure and that the second and third figures are imperfect, departing from the true and evident order of reasoning that the syllogism should have. Consequently, the four moods of the first figure are perfect moods, the four moods of the second figure and the six moods of the third figure are imperfect. Compare the following three moods, one in each figure of the syllogism:

<i>Fig. I</i>	<i>Fig. II</i>	<i>Fig. III</i>
No M is P.	No P is M.	No M is P.
Some S is M.	Some S is M.	Some M is S.
Some S is not P.	Some S is not P.	Some S is not P.

It is clear that an argument is more evident in the first figure than in the second or third, primarily because the middle term occupies the middle position in the first figure. It is clear also that the mood in Figure II could be changed easily to the mood in Figure I by converting the major premise.

<i>Fig. II</i>	<i>Fig. I</i>
No P is M.	No M is P.
Some S is M.	Some S is M.
Some S is not P.	Some S is not P.

Likewise, the mood in Figure III could be changed easily to the mood in Figure I by converting the minor premise.

<i>Fig. III</i>	<i>Fig. I</i>
No M is P.	No M is P.
Some M is S.	Some S is M.
Some S is not P.	Some S is not P.

We call such an operation the reduction of a syllogism to the first figure, that is, the reduction of the imperfect moods of the second and third figures to the perfect moods of the first figure. We can reduce all the moods of the second and third figures to those of the first figure. However, not all the imperfect moods reduce so easily to the perfect moods as the examples we used. In both cases we only had to convert a premise simply to make the reduction. If we were to go through all the imperfect moods and reduce them to the perfect moods, we should find that in some cases we convert both conclusions and premises simply, and in other cases convert premises accidentally. We should discover also that in two cases the premises would have to be changed around, that is, transposed. And in two other cases it would become apparent that the only reduction possible is by contradiction.

It would be a stimulating exercise to go through all the imperfect moods (except *A-O-O* in Figure II and *O-A-O* in Figure III, which present special difficulties) and figure out how each imperfect mood is reduced to a perfect mood in the first figure. The following model could be used as an example:

Every dog is an animal.  
No stone is an animal.  
Therefore, no stone is a dog.

How can this mood in Figure II be reduced to a perfect mood in Figure I?

Let us notice first that the middle term in Figure I has to be in the subject position in the major premise. The middle term is "animal." The simplest solution would be to convert the major premise, *Every dog is an animal*. But this proposition is a universal affirmative, and must be converted accidentally to: *Some animal is a dog*. The syllogism would then appear as follows:

Some animal is a dog.  
No stone is an animal.  
Therefore, no stone is a dog.

This syllogism, though now in Figure I, is invalid. The term "dog" in the conclusion is distributed, but is undistributed in the major premise. Furthermore, the conclusion is universal, whereas the major premise is particular; the conclusion is not following the weaker part. This solution, therefore, will not work.

However, the universal negative proposition in the minor premise will convert simply: *No stone is an animal* to *No animal is a stone*. The syllogism would then appear this way:

Every dog is an animal.  
 No animal is a stone.  
 Therefore, no stone is a dog.

But this syllogism is not in Figure I. In fact, the middle term is in the predicate position in the major premise and in the subject position in the minor premise, which is an unsyllogistic order, that is, the middle term is in the most universal position in the major premise and in the least universal position in the minor premise. It cannot properly function as a middle term in such a position.

However, if we change the premises around, we shall get the middle term in its right position in Figure I:

No animal is a stone.  
 Every dog is an animal.

In changing the premises around, we are making the major premise of Figure II the minor premise of Figure I, and the minor premise of Figure II the major premise of Figure I. Consequently, we are also changing the major term in Figure II to the minor term in Figure I, and the minor term in Figure II to the major term in Figure I. For this reason, we shall also have to convert the conclusion in Figure II, *No stone is a dog*, to *No dog is a stone*, to make it the conclusion in Figure I.

The reduction is now complete and can be diagrammed in the following way:

Figure II

Every dog is an animal.—\_\_\_\_ le<sub>2</sub> to  
 No stone is an animal.-----  
 Therefore, no stone is a dog. converted to>

Figure I

No animal is a stone.  
 Every dog is an animal.  
 Therefore, no dog is a stone.

We can also use a formula designed to make the reduction of syllogisms relatively quick and easy. An ingenious list of Latin names has been devised to facilitate the reduction of imperfect moods to perfect moods. These names signify, by means of their vowels, the valid moods of each figure of the syllogism:

Figure I

A — A — A	Barbara	(major, minor, conclusion)
E — A — E	Celarent	
A — I — I	Darii	
E — I — O	Ferio	

## Figure II

E — A — E	<i>Cesare</i>
A — E — E	<i>Camestres</i>
E — I — O	<i>Festino</i>
A — O — O	<i>Baroco</i>

## Figure III

A — A — I	<i>Daraptz</i>
E — A — O	<i>Felapton</i>
<b>I</b> — <b>A</b> — <b>I</b>	<i>Dz'samz's</i>
A — I — I	<i>Datzsz</i>
<b>O</b> — <b>A</b> — <b>O</b>	<i>Bocardo</i>
E — I — O	<i>Fenson</i>

The names also signify, by means of certain consonants, how to reduce the moods of the second and third figures to those of the first figure. The first letter of each name in the second and third figures tells which moods of the first figure these imperfect moods reduce to. Thus, *Cesare* in the second figure is to be reduced to *Celarent* in the first; *Disarms* in the third figure is to be reduced to *Darii* in the first.

In addition, certain consonants within the names tell what process to use in reducing the imperfect moods to the perfect moods. These consonants are: *s* for simple conversion; *p* (*per accidens* in Latin) for accidental conversion; *m* (*mutatio* in Latin) for changing the premises around, that is, transposing them; and *c* for reduction by contradiction. These consonants always refer to the vowels preceding them.

Let us now use an example. The name *Disamis* signifies the following: (1) This mood of the third figure is to be reduced to *Darii* in Figure I. (2) The major premise *I* is to be converted simply (*Dz'S*). (3) The minor premise *A* is to be changed in position with the major premise (*aM*). (4) The conclusion is to be converted simply (*iS*). Thus, we see that every letter in the word *Disamis* signifies something. Now let us work it out with an example.

	D
Some voters are soldiers.	I
	S
All voters are citizens.	A
	M
Therefore, some citizens are soldiers.	I
	S

We want to reduce this syllogism to *Darii* in Figure I. We convert the first premise to:

Some soldiers are voters. (DIS)

We exchange the position of the second premise with that of the first:

All voters are citizens. (AM)  
Some soldiers are voters.

We convert the conclusion simply, and thus get the full syllogism in the perfect mood *Darii* in Figure I:

All voters are citizens.  
Some soldiers are voters.  
Therefore, some soldiers are citizens. (IS)

It should be noticed that the argument is in better logical order in Figure I than in Figure III. The middle term is in the middle position in Figure I. Furthermore, the major premise of the argument is really *All voters are citizens*, as in Figure I, because it is more universal.

Let us take another example, this time of reduction by contradiction, which is more difficult because it is not a direct reduction. It is an indirect reduction showing, through a perfect mood of Figure I, that the imperfect mood is valid. There are only two cases of reduction by contradiction: Baroco in Figure II and Bocardo in Figure III. Let us take Baroco in Figure II, where *B* signifies reduction by means of Barbara in Figure I, and *c* signifies reduction by contradiction. Let us use the following syllogism:

All voters are citizens.	<b>B</b> <b>A</b>
Some Americans are not citizens.	<b>R</b> <b>O</b> <b>C</b>
Therefore, some Americans are not voters.	<b>O</b>

This reduction, because it is by contradiction, assumes that an opponent admits the premises of the argument but denies the conclusion. If he denies the conclusion, then he holds the contradictory of the conclusion to be true, namely, *All Americans are voters*.

We now take the opponent's position and construct a syllogism in Barbara out of it. Remember that the opponent has admitted the

premises but denied the conclusion. Hence, we can take the original major premise as it is:

All voters are citizens.

To this we add the contradictory of the conclusion, which the opponent claims is true:

All Americans are voters.

Drawing the conclusion from these premises, we now have this syllogism:

	B
All voters are citizens.	A
	R
	B
All Americans are voters.	A
	R
Therefore, all Americans are citizens.	A

But notice that the conclusion *All Americans are citizens* contradicts the original minor premise in Baroco, *Some Americans are not citizens*. The opponent, however, has admitted the truth of that premise. He cannot contradict his own position. Hence, he cannot deny the original conclusion in Baroco while admitting the premises. Therefore, the original syllogism in Baroco is valid, and is shown to be so indirectly, by the process of contradiction, through the perfect mood of Barbara.

The other imperfect moods of the syllogism can be reduced to the perfect moods in similar ways. The process of reduction is useful chiefly for showing the superiority of Figure I, wherein reasoning is manifested according to perfect logical order and in the most evident manner.

#### QUESTIONS----CHAPTER EIGHTEEN

1. Why is the first figure the perfect and most evident one.
2. Why were the Latin names *Barbara*, *Celarent*, and so forth, devised?
3. Explain the signification of the vowels and the consonants in the Latin names.
4. What does the reduction by contradiction show?
5. What is the usefulness of reducing syllogisms to the first figure?

*EXERCISE—CHAPTER EIGHTEEN*

Reduce the following syllogisms to the first figure.

1. Every A is B.  
Some C is not B.  
Therefore, some C is not A.
  
2. Every B is A.  
Every B is C.  
Therefore, some C is A.
  
3. Every A is B.  
No C is B.  
Therefore, No C is A.
  
4. No sinner is virtuous.  
Every saint is virtuous.  
Therefore, no saint is a sinner.
  
5. Some concessions are not justified.  
All concessions are compromises.  
Therefore, some compromises are not justified.





## Chapter nineteen

### THE ABBREVIATED SYLLOGISM

“THE abbreviated syllogism is a categorical syllogism—with one proposition missing. The missing proposition may be a premise or the conclusion. *Every man has sensation, because every man is an animal* is an abbreviated syllogism.

According to present usage, the name “enthymeme” is given to any abbreviated statement of an argument. In traditional logic, however, the name “enthymeme” is applied only to a specific type of argument proceeding from probabilities or signs. This type of argument is used principally by the rhetorician. For example, the rhetorician might argue that a man is guilty from the sign that he is trembling. The rhetorician states his argument in this abbreviated form, expecting the hearer to supply the complete statement of the argument. Thus, in the example, a hearer would supply, at least implicitly, the complete argument: *Whoever is trembling is guilty; this man is trembling; therefore, this man is guilty.* Enthymemes used by the rhetorician usually do not have the universality necessary for a true syllogism, and for this reason most enthymemes cannot be expanded into a true syllogism.

From this particular characteristic of stating arguments in shortened form, the name “enthymeme” has been extended to any abbreviated argumentation. Usage has somewhat sanctioned this extended meaning of the term, but we shall keep the distinction between abbreviated syllogism and the specific type of abbreviated syllogism known as the enthymeme, which is primarily found in rhetorical argumentation.

It is important to consider the abbreviated syllogism because we constantly use this informal way of stating syllogistic reasoning. We are not likely to say: *Every human being is capable of speech; no ape is capable of speech; therefore, no ape is a human being.* We are more likely to say: *No ape is a human being, because no ape is capable of speech,* without stating the full argument.

Now, while it is all right to speak informally in this way, it is important to recognize the full process of reasoning implied in this shortened form of argument. The precise logical significance of the informal expression is contained in the expansion of the abbreviated syllogism, as we gave it in the preceding paragraph. It is important, then, to know how to analyze abbreviated syllogisms and to expand them quickly. We shall then be able to see what the full argument is and to avoid fallacies in thinking, for, while the abbreviated syllogism is a convenient mode of expression, it is also a frequent source of fallacies. The missing proposition of the abbreviated syllogism often hides fallacies.

Let us take the first example we gave of an abbreviated syllogism and examine the procedure for expanding it into a full syllogism, after which we can test its validity. This abbreviated syllogism was: *Every man has sensation, because every man is an animal.* We are stating as true, *Every man has sensation.* We are also stating why it is true, *because man is an animal.* The first statement is the proposition we are trying to prove, and consequently is a conclusion. The second statement is a reason for the conclusion, and consequently is a premise. This example, then, is an abbreviated syllogism with a missing premise.

#### THE PROCEDURE FOR EXPANDING AN ABBREVIATED SYLLOGISM

##### 1. *Look for the conclusion first*

There are two ways of discovering which of the two propositions in an abbreviated syllogism is the conclusion.

The first way is to examine the structure of the thought expressed. The conclusion is always the proposition to be proved. A premise, on the contrary, is always a reason proving a conclusion. In the example, we wish to prove that every man has sensation by means of the proposition that every man is an animal. Once we know that the statement to be proved is the conclusion, then we not only know that the other proposition is a premise, but we also know *which* premise it is. In the example—*Every man has sensation, because every man is an animal*—we know that the *given* premise is the *minor* premise because the subject of the conclusion, the minor term, is repeated in the given premise. We then know that the missing premise is the *major* premise. We can now construct the missing major premise by combining the predicate of the conclusion with the middle term, *Every animal has sensation.* Finally, we can arrange the three propositions in their correct syllogistic order, and check for validity.

Every animal has sensation, (*the missing major premise*)  
 Every man is an animal. (*the given minor premise*)  
 Therefore, every man has sensation.

The second way of discovering which of two propositions is the conclusion is to look for key words in the abbreviated syllogism. These key words will introduce a conclusion or a premise. Such words as *therefore*, *hence*, and *consequently*, introduce a conclusion. For example:

Logic is a liberal art, and *therefore* logic is useful.

Such words as *because*, *since*, and the conjunction *for*, introduce a premise. They signify a causal connection because the premises are the cause of the conclusion. For example:

No dog is a stone, *because* every dog is alive.  
*or*  
*Because* every dog is alive, no dog is a stone.

2. If there is no conclusion, the abbreviated syllogism contains two premises

An abbreviated syllogism with two premises is not nearly so frequent as one with a premise and a conclusion. We can detect an abbreviated syllogism with two premises either negatively or positively: negatively, by the absence of key words introducing a premise or a conclusion; positively, by such key words as *and* or *but*, which serve to join premises. The following is an example of an abbreviated syllogism with two premises:

Every gentleman is courteous *and* every student is a gentleman.

## CHOICE OF FIGURES IN EXPANDING AN ABBREVIATED SYLLOGISM

In some of the abbreviated syllogisms containing a premise and a conclusion, there is a choice of figures in expanding them into full syllogisms. Consider the following abbreviated syllogism, in which letters stand for terms: *Every X is Y because every X is Z.* It is clear that this abbreviated syllogism contains the conclusion and the minor premise:

----- (missing major)  
Every X is Z.  
Therefore, every X is Y.

It is possible to expand this abbreviated syllogism in either of the following ways:

*Figure I*

Every Z is Y.  
Every X is Z.  
Therefore, every X is Y.

*Figure II*

Every Y is Z.  
Every X is Z.  
Therefore, every X is Y.

Now the question is, which figure should we use to expand the abbreviated syllogism? If we expand it in Figure I, the argument will be in a valid mood. If we expand it in Figure II, the argument will be in an invalid mood.

One way to solve this question is to look at the conclusion of the abbreviated syllogism. If the conclusion is true, or at least probably true, then expand the abbreviated syllogism in the figure having the valid mood. Suppose that the abbreviated syllogism is *Paul has sensation because he is rational*. This would appear as follows:

(missing major premise)

Paul is rational.  
Therefore, Paul has sensation.

Notice that we have a syllogism containing singular propositions. We can, of course, have syllogisms with singular propositions, but we should be aware that such syllogisms depart from the proper notion of the syllogism, which is on the level of universality. Syllogisms containing singular propositions, therefore, participate imperfectly in the proper notion of the syllogism. When singular propositions are used in a syllogism, they function like the universal affirmative or the universal negative proposition.

The conclusion of the abbreviated syllogism *Paul has sensation* is true. Since this is the case, the abbreviated syllogism should be expanded in the figure having the valid mood, Figure I in this case:

Everyone who is rational has sensation.  
Paul is rational.  
Therefore, Paul has sensation.

Suppose, however, the abbreviated syllogism is *Every capitalist is reactionary because every capitalist is anti-Communist*. This abbreviated syllogism would appear as follows:

(missing major premise)

Every capitalist is anti-Communist.  
Therefore, every capitalist is reactionary.

The conclusion of this argument is not true. Now this abbreviated syllogism could be expanded in the following way:

Every anti-Communist is reactionary.  
Every capitalist is anti-Communist.  
Therefore, every capitalist is reactionary.

In this expansion, the syllogism is valid in Figure I. If one is only concerned with stating the correct formal expansion of the abbreviated syllogism, the argument can be treated in this way. We should then point out that one or more of the propositions in the argument is false even though the form of the syllogism is valid.

It is usually more effective in actual discussion, however, to show that the argument is bad in form, since a defect in an argument can be recognized more readily by seeing that the conclusion does not follow from the premises. For this reason, it would be better to expand this abbreviated syllogism in Figure II, where the formal fallacy of the undistributed middle term is made evident:

Every reactionary is anti-Communist.  
Every capitalist is anti-Communist.  
Therefore, every capitalist is reactionary.

We conclude, therefore, that when there is a choice of figures in expanding the abbreviated syllogism, and when the conclusion is false—or when the reason adduced in the premise does not appear cogent—it is better to expand the abbreviated syllogism in the figure having the invalid mood, thus showing the weakness of the argument.

#### QUESTIONS—CHAPTER NINETEEN

1. What is an abbreviated syllogism?
2. What is the proper meaning of an enthymeme? What is the distinction between an enthymeme and an abbreviated syllogism?
3. Why is it important to consider the abbreviated syllogism?
4. How do we discover the conclusion of an abbreviated syllogism?
5. What key words introduce premises? Why do they introduce premises?
6. How can we tell when the conclusion is missing from an abbreviated syllogism?
7. When there is a choice of figures, how is an abbreviated syllogism expanded?
8. Make up three original abbreviated syllogisms and expand them.



EXERCISE—CHAPTER NINETEEN

Expand the following abbreviated syllogisms. If, after expansion, the argument is invalid, explain why the argument is bad or state the rule violated.

1. Every A is B, because every C is B.
2. No C is A; therefore no C is B.
3. Since every Z is X, every X is Y.
4. Every animal is a body, for every animal is an organism.
5. Some sports are strenuous, because all football games are sports.

6. All mice are rodents but no squirrels are mice.
7. Every Christian is a Fascist, because every Fascist is anti-Communist.
8. No students are ignorant, because some students are freshmen.
9. No women are good drivers, since no women are men.
10. John Jones is an enemy of education, because he criticizes educators.



## *Chapter Twenty*

### *THE COMPOUND SYLLOGISM*

THE syllogism is divided essentially into the categorical and compound (or hypothetical). Let us recall that in Chapter Nine we divided the proposition into the categorical and compound. The division of the syllogism is based upon this division of the proposition. We shall now consider the compound syllogism and its main kinds.

A compound syllogism is one in which the major premise is a compound proposition and the minor premise is a categorical proposition. The minor premise must either posit (affirm) or destroy (deny) one of the parts of the compound proposition in the major premise.

It might seem as though we could define the compound syllogism more simply as a syllogism that contains compound propositions. We should then be led, however, to regard the following as a compound syllogism:

If X is, then Y is.  
If Z is, then X is.  
Therefore, if Z is, then Y is.

This argument, however, is not a compound syllogism; it is still a categorical syllogism. The compound syllogism does not depend upon a connection of the terms, but on the connection between the propositions of the syllogism. Therefore, it is necessary to state in the definition of the compound syllogism not only that the major premise is a compound proposition, but that the minor premise must either posit or destroy one part of the compound proposition, as in the following:

If X is, then Y is.  
X is.  
Therefore, Y is.

The compound syllogism itself is divided into the conditional and the disjunctive syllogism. The basis for the division is whether the major premise is a conditional or a disjunctive proposition. (Sometimes a conjunctive syllogism is also listed, in which the major premise is a conjunctive proposition, for example, *X cannot at the same time be Y and Z*. The conjunctive syllogism, however, is reducible to the conditional syllogism, just as the conjunctive proposition is reducible to the conditional proposition.)

### THE CONDITIONAL SYLLOGISM

The conditional syllogism is the more important compound syllogism. A conditional syllogism is a compound syllogism having a conditional proposition as the major premise and a categorical proposition as the minor premise. The conditional proposition, as we saw in Chapter Fourteen, has an antecedent and a consequent. Now the minor premise of a conditional syllogism must either posit or destroy the antecedent or the consequent of the major premise. We shall consider first whether the minor premise should posit the antecedent or the consequent. Let us try both cases.

If Paul walks, Paul moves.  
Paul walks.  
Therefore, Paul moves.

In this conditional syllogism, the minor premise posits the antecedent and the conclusion posits the consequent. The syllogism is valid because Paul's moving necessarily follows upon Paul's walking. Let us try the other possibility.

If Paul walks, Paul moves.  
Paul moves.  
Therefore, Paul walks.

In this conditional syllogism, the minor premise posits the consequent and the conclusion posits the antecedent. But this syllogism is not valid because Paul's walking is not a necessary consequence of Paul's moving; his movement might be only the movement of pointing. There must be a necessary dependence of the consequent upon the antecedent if the conditional syllogism is to be valid. Hence, we infer the following rule for the conditional syllogism: *When the minor premise posits the antecedent, the conclusion must posit the consequent.*

We must also consider whether the minor premise should destroy

the antecedent or the consequent in the major premise. Let us examine the following syllogism:

If Paul walks, Paul moves.  
Paul is not walking.  
Therefore, Paul is not moving.

This is a conditional syllogism in which the minor premise destroys the antecedent and the conclusion destroys the consequent. However, it is not valid because Paul's not moving does not necessarily follow upon Paul's not walking, since, again, he could be pointing. The conclusion, therefore, does not follow from the premises. Let us try the other possibility.

If Paul walks, Paul moves.  
Paul is not moving.  
Therefore, Paul is not walking.

In this syllogism, the minor premise destroys the consequent and the conclusion destroys the antecedent. This syllogism is valid because Paul's not walking necessarily follows upon Paul's not moving, that is, Paul cannot walk without moving. Hence, we infer a second rule for the conditional syllogism: *When the minor premise destroys the consequent, the conclusion must destroy the antecedent.*

The conditional syllogism has two figures. The first figure is based upon the first rule of the conditional syllogism, namely, when we posit the antecedent in the minor premise we must posit the consequent in the conclusion. The second figure is based upon the second rule of the syllogism, namely, when we destroy the consequent in the minor premise we must destroy the antecedent in the conclusion. There are four moods for each figure—four possible ways of validly working out the rule for each figure. The figures and moods are given below.

*First Figure*

*(positing antecedent to  
positing consequent)*

- I. If A is B, A is C.  
A is B.  
Therefore, A is C.
- II. If A is B, A is not C.  
A is B.  
Therefore, A is not C.
- III. If A is not B, A is C.  
A is not B.  
Therefore, A is C.

*Second Figure*

*(destroying consequent to  
destroying antecedent)*

- I. If A is B, A is C.  
A is not C.  
Therefore, A is not B.
- II. If A is B, A is not C.  
A is C.  
Therefore, A is not B.
- III. If A is not B, A is C.  
A is not C.  
Therefore, A is B.

- |   |   |
|---|---|
| IV. If A is not B, A is not C.<br>A is not B.<br>Therefore, A is not C. | IV. If A is not B, A is not C.<br>A is C.<br>Therefore, A is B. |
|---|---|

Some confusion may arise in certain moods because of the words “positing” and “destroying.” For example, in the first figure, the minor premise posits the antecedent. When the antecedent of the conditional proposition in the major premise is negative, as in the third mood of the first figure, then to “posit” the antecedent in the minor premise means to repeat the antecedent in its negative form. If one were to make this antecedent in the minor premise affirmative, it would “destroy” the antecedent of the major premise. Consequently, to “posit” the antecedent in the minor premise means to repeat the antecedent just as it was in the major premise. The following example illustrates this point.

If a man is not breathing, he is dead.  
This man is not breathing, (*positing* the antecedent)  
Therefore, he is dead.

In the second figure, the minor premise destroys the consequent. If the consequent in the major premise is negative, then to “destroy” it in the minor premise means that it must be affirmed in the minor premise, since to “destroy” a negation is to make an affirmation. Thus, the second mood of the second figure would appear as follows:

If a man is breathing, he is not dead.  
This man is dead, (*destroying* the consequent)  
Therefore, he is not breathing.

#### THE DISJUNCTIVE SYLLOGISM

A disjunctive syllogism is a compound syllogism having a disjunctive proposition as its major premise and a categorical proposition as its minor premise. The minor premise either posits or destroys one member of the disjunction. As we saw in Chapter Fourteen, a disjunctive proposition has categorical propositions joined by the connectives *either . . . or*. Since a disjunctive proposition is the major premise of the disjunctive syllogism, the minor premise must either posit one member of the disjunction and the conclusion destroy the other, or the minor premise must destroy one member of the disjunction and the conclusion posit the other. Thus we have two figures for the disjunctive syllogism and two moods for each figure.

*Figure I**(the minor posits')*

- I. X is either A or B.  
 X is A.  
 Therefore, X is not B.

- II. X is either A or B.  
 X is B.  
 Therefore, X is not A.

*Figure II**(the minor destroys)*

- I. X is either A or B.  
 X is not A.  
 Therefore, X is B.

- II. X is either A or B.  
 X is not B.  
 Therefore, X is A.

We must presume, in these figures, that we have a strict disjunctive proposition as the major premise. The strict disjunctive proposition asserts that one and only one of two alternatives can be true, that is, both alternatives cannot be true. Therefore we can posit one member in the minor premise and destroy the other in the conclusion or destroy one member in the premise and posit the other in the conclusion. Thus, we can argue as follows:

Ten is either odd or even.  
 Ten is not odd.  
 Therefore, ten is even.

It is evident that in the disjunctive syllogism everything depends upon the disjunction in the major premise. The question one should always ask, in examining a disjunctive syllogism, is, "Does the major premise contain a strict disjunction?" or "Is there a third possibility?" If the disjunction is a strict one, then when the minor premise is true, the conclusion necessarily follows. Consider, however, the following argument:

A man is either a Communist or a Fascist.  
 This man is not a Communist.  
 Therefore, he is a Fascist.

This syllogism is not valid, because the disjunction in the major premise is not a strict one. A man may be neither a Communist nor a Fascist. Nevertheless, arguments like this are frequently used and often accepted uncritically.

Sometimes a disjunctive syllogism has a loose or improper disjunction in the major premise. Such a syllogism, although it departs from the proper disjunctive syllogism, has a certain limited use. The improper disjunctive syllogism has a major premise in which there are more than two members. In this kind of syllogism, the following rules must be observed. (1) *When one member is posited in the minor premise, the other members must be destroyed in the conclusion.* For example:

Paul is a freshman, sophomore, junior, or senior.  
 Paul is a freshman.  
 Therefore, Paul is not a sophomore or a junior or a senior.

And (2) *When one member is destroyed in the minor premise, the other members must be posited disjunctively in the conclusion.* For example:

Paul is a freshman, sophomore, junior, or senior.  
 Paul is not a senior.  
 Therefore, Paul is a freshman or a sophomore or a junior.

#### QUESTIONS---CHAPTER TWENTY

1. Define the compound syllogism.
2. What is the difference between the compound syllogism and the categorical syllogism?
3. Explain the antecedent and the consequent of a conditional proposition. What does the conditional syllogism do with the antecedent and the consequent of the conditional proposition?
4. What necessary condition must be realized for the conditional syllogism to be valid?
5. Criticize the following conditional syllogism:  
     If it was raining, I wore a brown hat.  
     I wore a brown hat.  
     Therefore, it was raining.
6. Give original, valid examples of conditional syllogisms in any two moods of the first figure and any two moods of the second figure.
7. What is the relation between the rules for the conditional syllogism and the general principles of argumentation given in Chapter Fifteen?
8. Define a disjunctive syllogism.
9. Criticize the following disjunctive syllogism:  
     A student is either intelligent or lazy.  
     This student is lazy.  
     Therefore, he is not intelligent.
10. What is an improper disjunctive syllogism?

GENERAL EXERCISE ON SYLLOGISTIC REASONING

(Chapters Seventeen to Twenty)

In the following excerpt, paraphrased and condensed from the *Summa Theologica* of St. Thomas Aquinas, examine the reasoning employed. State all categorical syllogisms, abbreviated syllogisms or compound syllogisms in full and logical form, and check for validity. The third part of *I answer that* can be omitted, as well as the replies to objections.

Whether God Is a Body?

(*Summa Theologica*, I, Q. III, Art. 1)

Objection 1. It seems that God is a body. Now a body is that which has three dimensions. But God has three dimensions, according to Sacred Scripture, which says: "He is higher than Heaven, and what wilt thou do? He is deeper than Hell, and how wilt thou know? The measure of Him is longer than the earth and broader than the sea" (Job, xi, 8, 9). Therefore, God is a body.

Objection 2. Everything that has a figure is a body, since figure is a quality of quantity. But God seems to have figure, for it is written: "Let us make a man to our image and likeness," (Gen. i, 26), and a figure is called an image, as is also said in Scripture (cf. Heb. i, 3). Therefore, God is a body.

Objection 3. Everything that has corporeal parts is a body. But Scripture attributes corporeal parts to God, when it says: "Hast thou an arm like God?" (Job, xl, 4). And again: "The eyes of the Lord are upon the just" (Psalms, xxxiii, 16). And also: "The right hand of the Lord hath wrought strength" (Psalms, cxvii, 16). Therefore, God is a body.

Objection 4. If God has posture, then God has a body. But things pertaining to posture are said of God in Scripture: "I saw the Lord sitting" (Isa. vi, 1). And also: "He standeth up to judge" (Isa. iii, 13). Therefore, God is a body.

*On the contrary:* It is said in Scripture: "God is a spirit" (John iv, 24).

*I answer that:* God is in no way a body, and this can be shown in three ways. *First*, because all bodies are moved, as is evident by induction. Now, it has been shown previously (Q. II, Art. 3) that since God is the First Mover, He is not moved. Therefore, it is clear that God is not a body.

*Second*, because the first being cannot be in potency, for potency is posterior to act. Now it was shown above (Q. II, Art. 3) that God is the first being. Therefore, it is impossible that potency be in God. Every body is in potency, because every body is continuous. Now the continuous is divisible to infinity. But God is not divisible to infinity. Therefore, it is impossible that God is a body.

*Third*, because God is the most noble of beings, as was shown previously (Q. II, Art. 3). Now, it is impossible for a body to be the most noble of beings. For a body is either living or non-living, and it is evident that a living body is more noble than a non-living body. But a living body is not living in so far as it is a body, otherwise all bodies would be living. Therefore, its living must be by something else, just as our body lives through the soul. Now, that by which a body lives is more noble than a body. Therefore, it is impossible that God is a body.

Reply to Objection 1. As was said previously (Q. I, Art. 9), Sacred Scripture presents spiritual and divine things under the likeness of corporeal things. Hence, when it attributes three dimensions to God under the likeness of corporeal quantity, it designates His virtual quantity. Thus, by depth it signifies His power of knowing hidden things; by height, the excellence of His power above all others; by length, the duration of His existence; by breadth, His act of love for all. . . .

Reply to Objection 2. Man is said to be in the image of God, not according to his body, but with respect to that whereby man excels the other animals. Hence, when it is said in Scripture "Let us make man to our image and likeness," there is added, "And let him have dominion over the fishes of the sea" (Gen. i, 26). Now, man excels all animals by his reason and intellect. Hence, it is according to his reason and intellect, which are incorporeal, that man is said to be in the image of God.

Reply to Objection 3. Corporeal parts are attributed to God in Scripture because of His acts, according to a certain likeness. For example, the act of the eye is to see, and hence the eye attributed to God signifies His power of seeing intellectually, not sensibly. And it is the same with other corporeal parts.

Reply to Objection 4. Whatever pertains to posture is likewise attributed to God only by a certain likeness. God is said to be "sitting" because of His immutability and authority. He is said to be "standing" because of His power of overcoming whatever is opposed to Him.



## Chapter Twenty-one

### INDUCTION

T N Chapter Fifteen we treated argumentation in general and -L-made the division of argumentation into its two main kinds: deductive and inductive. Deductive argumentation is the same as the syllogism, which we have discussed.

We shall now consider induction, but before treating induction directly, two points should be stressed. The first is the reason for treating induction after deduction. Since the syllogism is the fundamental kind of argumentation, induction must be studied and understood in relation to the syllogism. We cannot, in fact, understand the validity of the formal consequence that belongs to induction except in relation to the syllogism, where the formal consequence is perfectly realized. From the standpoint of argumentation as such, induction is less perfect.

The second point is that a logical analysis of induction is concerned with only a few fundamental notions. To appreciate this, it is necessary to distinguish between the consideration of induction as a mode of argumentation, which belongs to logic, and the application of induction in various branches of philosophy and experimental science. The latter consideration is more complex and deservedly needs extensive elaboration. But such a treatment of induction does not belong in a logic text, particularly an elementary logic text. It is the business of the logician simply to analyze induction as a mode of reasoning; this common mode of inductive reasoning is then applied variously in the different sciences.

We defined induction in Chapter Fifteen as *an argumentation proceeding from singulars to universals*. By “singulars” we understand primarily the singulars perceived by sense. More broadly, “singulars” also means “less universal,” in which case induction is understood to proceed from the less universal to the more universal; for example, we can reason from the different kinds of motion to the nature of motion

itself. In the primary meaning of induction, however, we proceed from the singulars known by sense to a universal judgment. The “universals” in the definition refer to universal judgments drawn from singular instances.

All argumentation, whether syllogistic or inductive, rests upon a connection of terms. Let us recall that the middle term has two functions: (1) it connects the extremes, and (2) in the perfect figure of the syllogism, it is also middle in universality. Hence, a syllogism in the first figure proves that two extremes (a subject and a predicate) are joined with each other by means of a middle term that connects them by being middle in universality. Thus, if we are proving that *Z is X* in the perfect figure of the syllogism, we do so by reason of a middle term *Y*, which connects them and is middle in universality.

Induction establishes a relation between one extreme and a middle *by means of the other extreme*. In induction, the two functions of the middle are distinct. Let us take the terms *x*, *y*, and *z* again. Induction proves that *x* belongs to *y* by reason of *z*. Here *y* functions as a middle in universality (that is, *X* is said of *y* and *y* is said of *Z*), and *z*, as an extreme, has the function of connecting *X* and *y* in the conclusion. Let us notice, then, the essential opposition between the syllogism and induction. In the perfect figure of the syllogism, the term used to connect the terms of the conclusion is also a true universal that is middle in universality. In induction, however, the term used to connect the terms of the conclusion is not a true universal, but an enumeration of singulars. It is the absence of a truly universal middle term to connect the terms of the conclusion that essentially distinguishes induction from the syllogism. An inductive argument would thus appear as follows, first in symbols, and then in words:

Every *Z* is *X*.  
Every *Z* is *Y*.  
Therefore, every *Y* is *X*.

Peter, Paul, James, John, and all other individuals are mortal.  
Peter, Paul, James, John, and all other individuals are all men.  
Therefore, every man is mortal.

In the first proposition, the subject is an enumeration of the individuals. We make this enumeration the subject of the characteristic *mortal* that we want to conclude of it. In the second proposition, we again use the enumeration of individuals as the subject, but we now identify it with the universal *all men*. In the conclusion, we can then predicate *mortal* of the universal that embraces the enumeration of the singulars, *every man*.

The complete enumeration of the singulars is necessary for the

validity of the formal consequence of induction. By this we do not mean that we have to count all the singular instances or have experience of each of them. We mean, rather, that the form of induction requires that the note of universality be present in the enumeration. It is sufficient, for universality, to say "and all others" after the actual particular instances we cite, for this is all that is required for universality on the part of the form of logic. For universality on the part of matter, however, we must go to the things signified to justify the universality assumed for the form of inductive argumentation. The considerations on the part of matter will determine whether our induction is certain or only probable. The following induction, because of the matter, will be only probable.

In September of this year, last year, the year before that, etc., the first frost has occurred.

What we say of September of this year, last year, the year before that, etc., can be said of every September.

Therefore, every September brings the first frost.

Our concern with induction, however, is only with the universality required by the form of logic. The universality required on the part of matter is considered in more advanced courses in logic and in the different sciences as they employ induction. For example, in the experimental sciences induction gives only probability of varying degrees because the experimental method has no way of establishing the necessary connection of the predicate with the subject. In some branches of philosophy, particularly in moral philosophy, inductive argumentation is often probable rather than certain.

We have spoken of induction as a form of reasoning less perfect than the syllogism. The syllogism is the perfect form of reasoning because a necessary consequence is established through the middle term, which functions as a truly universal middle connecting the extremes. The necessity of the consequence in inductive reasoning, however, is evident to us only as we see that it participates virtually in the more perfect form of the syllogism. By reducing induction *materially* to the syllogism, we shall see how it participates virtually in the syllogism.

We speak of this as a material reduction because we could never reduce the inductive form of argumentation to the syllogistic form. The reason for this is that the syllogism uses a truly universal middle to prove a mediate proposition, a proposition whose terms admit of a mean; but induction uses an extreme, the enumeration of the singulars, to prove an immediate proposition, a proposition whose terms admit of no true mean.

Reducing induction materially to the syllogism, then, means arranging the terms of induction in common syllogistic form, that is, so that the fundamental principles of the syllogism will apply. We do this by the simple conversion of the second premise of the inductive argument.

Thus, the inductive argument:

Every Z is X.  
Every Z is Y.  
Therefore, every Y is X.

is materially reduced to:

Every Z is X.  
Every Y is Z.  
Therefore, every Y is X.

We are permitted to convert simply the second premise of the inductive argument to the second premise of the syllogism because of the identity established between the enumeration of singulars (Z) and the universal nature found in the singulars (F). However, this is not a reduction to the syllogism in its proper sense, for in the restatement of the inductive argument in syllogistic form, there is not a true middle term for the syllogism, but only the enumeration of singulars (Z) substituting for the middle term. The reduction does indicate, nevertheless, how the verification of the formal consequence in induction must depend upon the fundamental principles of the syllogism, and that complete enumeration of the singulars is necessary for the consequence of the inductive form.

The primary purpose of induction is to make first principles and immediate propositions evident. We grasp the terms of first principles by seeing them inductively in several instances, as, for example, we know the immediate truth of *Every whole is greater than its part* by seeing several instances of it. Thus, induction enables us to grasp first principles with ease and certainty. This is necessary because we use first principles as premises of the primary syllogisms, upon which all other syllogisms depend.

#### QUESTIONS---- CHAPTER TWENTY-ONE

1. Why is induction treated after deduction?
2. To what extent does logic treat inductive argumentation?
3. Define *induction*. Explain the word "singulars."
4. How does induction prove a conclusion?
5. In induction, what term is used to show the connection of the terms of the conclusion?

6. What is the essential distinction between induction and the syllogism?
7. In what way is the complete enumeration of singulars necessary in induction?
8. What do we mean by the "complete enumeration of singulars"?
9. Distinguish between universality on the part of form and universality on the part of matter.
10. How is universality on the part of matter established in induction?
11. Why is there only a *material* reduction of induction to the syllogism?
12. Why can the second premise of an inductive argument be converted simply?
13. How does induction depend on the syllogism?
14. What is the primary purpose of induction?



## argumentation materially CONSIDERED

THUS far we have considered argumentation primarily on the part of form; our treatment has been of the syllogistic form and the inductive form of reasoning. Since an elementary text in logic should include certain things pertaining to the matter of logic, we must now take up, at least in a summary manner, argumentation on the part of matter. The consideration of the matter of argumentation is more difficult and extensive than the consideration of the form, and therefore constitutes the main part of an advanced course in logic. Nevertheless, a text in logic would be incomplete without a consideration of scientific demonstration, and other major distinctions made on the part of the matter of argumentation.

This order of considering argumentation with the emphasis first on the form, and then on the matter, is given by Aristotle in his *Prior Analytics* and *Posterior Analytics*. The word “analytics” signifies the resolution of the conclusion of a scientific proof back to its principles. Hence, to know scientifically is to see a thing in its causes and principles. For example, we know scientifically that every human being is mortal when we grasp the cause of human death, namely the inevitable separation of the principles of human nature, body and soul.

Resolution of the conclusion on the part of form is called “prior analytics.” This resolution is prior because we can abstract the common formality of reasoning, which is more known to us than its realization in a given matter. Resolution of the conclusion on the part of matter is called “posterior analytics.” This resolution is posterior because it is less known to us. In the *Posterior Analytics* Aristotle considers the most perfect kind of matter in which the form of reasoning can be realized, namely, necessary matter.

We shall divide this chapter according to the several kinds of matter

in which argumentation is found. First we shall treat demonstration, that is, reasoning in necessary matter; then dialectics, which is reasoning in probable matter. We shall also consider rhetorical argumentation and poetic argumentation. Since logic must also treat defective reasoning, we shall consider, in a separate chapter, sophistics, that is, fallacious reasoning.

### I. DEMONSTRATION

Demonstration is reasoning to a necessary conclusion. The syllogism used in this kind of reasoning is demonstrative. The demonstrative syllogism produces science in the strict sense. Science, according to the subject possessing it, is called either "doctrine" or "discipline." "Doctrine" means science as possessed by a teacher, that is, by one who, knowingly scientifically, assists in producing science in another. "Discipline" means the receiving of science by one who learns from another, that is, by a student from a teacher.

#### *The prerequisites for demonstration*

The human intellect obtains science in a discursive manner, by proceeding from the knowledge of one thing to that of another. Discursive knowledge proceeds from pre-existing knowledge to the knowledge of a conclusion, for the human intellect advances by going from something already known to something not yet known. We must presuppose, then, the knowledge of *whether something is* and also *what it is*; otherwise, we could not advance to the knowledge of something else. But we must determine more precisely what these prerequisites are for demonstration.

In a perfect demonstration we seek a conclusion in which a property is affirmed of its subject, as in the following example:

Every rational animal is grammatical.  
Every man is a rational animal.  
Therefore, every man is grammatical.

In the conclusion, the property *grammatical* belong necessarily, only, and always to the subject *man*. We see that this is true because of the premises in which the definition of *man* serves as the middle term, and is the cause of the connection of the property with the subject in the conclusion. Consequently, we must have foreknowledge of the following three things for demonstration:

- (1) Principles (premises)
- (2) Subject
- (3) Property



We must have foreknowledge of the premises in the sense that we must know whether the premises are true. We must have foreknowledge of the subject in the sense that we must know the real definition of the subject—what it is. The foreknowledge of the property need only be a nominal definition, that is, what it is by name, since we can see the necessary connection between the property and the subject without having to know the real definition of the property. The real definition of the property becomes evident in the conclusion of the demonstration where it is predicated of its proper subject.

*Definition of demonstration*

Let us state first what we mean by “science” in its strict sense. It is that kind of knowledge by which we know the cause on which a thing depends, that it is the cause of that thing, and that the thing cannot be other than it is. This is to know the proper cause of a thing. More briefly defined, science is certain knowledge through causes.

We can now define demonstration; and first according to its final cause. Demonstration is *a syllogism that produces science*. It causes science in us, not only as an act, but as a habit, a permanent disposition.

We shall define demonstration, secondly, on the part of matter. Demonstration is *a syllogism containing premises that are true, primary, immediate, and that are prior to, better known than, and causes of the conclusion*.

Notice that the definition of demonstration on the part of matter follows from the definition according to its purpose. Thus, from the kind of conclusion sought, that is, a scientific conclusion, we deduce the kind of premises required. Hence we define demonstration on the part of matter in terms of premises that are true, primary, immediate, and so forth.

The premises must be true because, although a true conclusion can follow from false premises, a true conclusion can be proved only from true premises. The truth of a premise is proved by making it stand as a conclusion following from other true premises. It is evident that not every premise can be proved to be true, for such a process would be infinite. If one thought that every premise had to have its truth demonstrated, he would logically have to hold that nothing could be proved, for the demonstrated truth of any premise depends upon proving the truth of something prior to it, and this on something else prior, and so on infinitely. Consequently, nothing could be unqualifiedly proved, which is to say, really demonstrated. But since we know that some propositions can be demonstrated to be true, it follows

that there is not an infinite regress in demonstration, and that there are some premises true without proof, that is, self-evident.

Self-evident propositions are the ultimate premises from which all demonstration is derived. A self-evident proposition is one in which the predicate is included in the essence of the subject. For example, in *Man is an animal*, *animal* forms part of the essence of man. Now, if the essence of both the predicate and the subject is known to us, then the proposition is self-evident to us. Propositions of this kind are the ultimate premises, the first principles of all demonstration. Some of these propositions are self-evident to all, for example, that every whole is greater than its part. Others are self-evident only to some, namely, to those who examine and study the nature of the subject and the predicate. For example, the proposition *Ideas are not in space* is self-evident to those who understand what ideas are and what space is.

But if the essence of the predicate and the subject of a proposition are not known to us, and if the predicate is contained in the essence of the subject, then such a proposition is self-evident in itself, but not to us; for example, the proposition *God exists*. This proposition, not being self-evident to us, has to be proved.

Now in the very first demonstration concerning a subject, we first predicate the definition of the subject in a self-evident proposition. We use this definition of the subject to demonstrate that a property inheres in the subject. We then use this property to show the connection between a second property and the subject.

We have said, in the definition of demonstration, that the premises must be true. They are true either as proved or as self-evident. Further, the premises must be primary, in the sense that any syllogism can be ultimately reduced to the first premises, the self-evident propositions that prove all other propositions. The premises must be immediate in the sense that they have no middle term by which they are proved, since they are indemonstrable. This refers again to self-evident propositions.

The premises are also prior to the conclusion in the sense that they must be prior in their truth, for it is by knowing the truth of the premises that we know the truth of the conclusion. The premises are better known than the conclusion because, according to our mode of knowing, we must proceed to a new truth from truths we already know. The premises, finally, are causes of the conclusion because of the middle term, which unites the premises and therefore produces the conclusion as an effect.

*Kinds of demonstration*

Demonstration is an analogous notion. The principal kind is demonstration by proper cause (*propter quid* demonstration). It is this kind that we have discussed so far because, in an analogous notion, we must start with the primary analogate, the other analogates having meaning only in relation to the primary one. The secondary kind of demonstration is demonstration of the fact (*quia* demonstration).

Demonstration by proper cause gives the proximate cause for the identification of the predicate with the subject in the conclusion. We have this kind of demonstration when the middle term is the definition of the subject. Through such a middle term, we prove that a property belongs to the subject of the conclusion. The following is an example of a demonstration by proper cause:

Every rational animal is capable of humor.  
Every man is a rational animal.  
Therefore, every man is capable of humor.

Demonstration of the fact is one that proves the truth of the conclusion without manifesting the proximate cause of this truth. This kind of demonstration proceeds from an effect in the premises, to the cause in the conclusion. Thus, we argue from the existence of a watch, as an effect, to the existence of the art of watchmaking, as a cause, in the conclusion. Demonstration of the fact can also proceed from a remote cause in the premises to an effect in the conclusion. Thus, *animal* is a remote cause of *grammatical* in man, for *animal* is the genus of *man*; it is a remote cause in predication; that is, man, who is animal, is grammatical.

However, we cannot argue that because something is an animal, therefore it is grammatical—the cause is too far removed. We may, however, argue that because something is not an animal, therefore it is not grammatical. Hence, demonstration of the fact from remote cause consists chiefly in showing the truth about some fact negatively.

We also divide demonstration accidentally into a priori and a posteriori. An a priori demonstration proves the effect from the cause. Thus we prove from the nature of man that he is capable of making works of art. An a posteriori demonstration proves the cause from the effect. Thus we prove from an examination taken by a student the extent of his knowledge when taking the examination.

Let us compare the two divisions of demonstration we have given. Demonstration by proper cause and demonstration of the fact is the

primary division because it is based upon the kind of truth obtained. The division into a priori and a posteriori demonstration is a secondary and accidental division, based upon whether our reasoning starts from the cause or the effect. Demonstration by proper cause, since it proceeds from cause to effect, will always be a priori demonstration. Demonstration of the fact will be a priori demonstration if it proceeds from remote cause to effect; if it proceeds from effect to cause, it will be a posteriori demonstration.

Demonstration is the final cause of logic. Everything considered in logic is taken up ultimately to achieve demonstrative argument. In fact, it is only through demonstration that we get science, strictly speaking.

It is not easy to achieve demonstration nor are we able to use it very frequently, since it presupposes knowledge and certitude not often possible to man. We should, nevertheless, understand what demonstration is. We should be able to distinguish the different kinds of demonstration as they are used in various parts of philosophy; in mathematics, where demonstration is most manifest for us; and in other sciences. But since most of our knowledge is probable rather than certain, opinion rather than science, we must next examine dialectical argumentation.

## II. DIALECTICS

Dialectical reasoning is like demonstrative reasoning in that it employs the syllogistic form, directly deducing conclusions from premises. A dialectical syllogism differs from a demonstrative syllogism in at least two ways: (1) A dialectical syllogism deduces conclusions from probable premises, the conclusion sharing in the probability of the premises; a demonstrative syllogism deduces certain conclusions from certain principles. (2) A dialectical syllogism produces opinion in the mind of the knower, whereas a demonstrative syllogism produces science in the mind of the knower. Opinion is the assent to something because of a probable motive or reason, but with fear that the opposite may be true. Hence, a dialectical syllogism, most simply defined, is *probable argumentation*.

We are defining dialectics here in relation to the primary form of argumentation, syllogistic argumentation. Now just as demonstrative argumentation is either syllogistic or inductive, so dialectical argumentation is syllogistic or inductive. In demonstrative argumentation, we use induction to arrive at *certain* principles. In dialectical argumentation, we use induction to arrive at *probable* principles.

However, we shall treat dialectical argumentation primarily in terms of the syllogistic form of reasoning.

We argue dialectically when we reason from probable principles which are generally held. By "generally held," we mean that they are held by men commonly, or by a majority of men, or by experts in various fields. Hence, we adhere to the principles, not on the strength or evidence of their truth, since this is not certain, but upon their likelihood or upon their general acceptance by others. In demonstrative argument, on the contrary, we adhere to the principles because of their own truth and evidence, and it makes no difference who or how many hold such principles. It follows, then, that where we can have truth and certainty in the principles, we should employ demonstrative argumentation, and not confuse it with dialectical argumentation. On the other hand, if we cannot have truth and certainty in our principles, then we should not pretend to use demonstrative argumentation, but should make use of dialectical argumentation.

Let us now outline the doctrine of dialectical argumentation—the general nature and method by which conclusions are deduced from probable principles. The consideration of how dialectical argumentation is applied in the different sciences is not our concern in logic.

A dialectical syllogism, like any other syllogism, infers a conclusion from the connection of terms in the premises. Although the conclusion of the dialectical syllogism is only probable, nevertheless the probable conclusion follows *necessarily*, by reason of the form, from the premises. Consider, for example, the following syllogism:

Every citizen honors his country.  
John Jones is a citizen.  
Therefore, John Jones honors his country.

This syllogism is dialectical because it is only a probable truth that every citizen honors his country. In virtue of the probable truth of the major premise, it is only probably true, as an inference, that John Jones honors his country. Nevertheless, because of the connection of the terms in the syllogism, the conclusion necessarily follows. Notice, then, that in a dialectical syllogism, we are inclined to accept the conclusion as true, although not without a kind of fear that the opposite may be true.

A dialectical syllogism is made up of dialectical propositions just as a demonstrative syllogism is made up of scientific propositions. A scientific proposition is a proposition that is certain, excluding completely the opposite possibility, as, *Every human being is mortal*. A dialectical proposition is a proposition that is probable, not excluding,

therefore, the opposite possibility, as, *Every mother loves her child*. Let us note, however, that a scientific proposition may be treated as dialectical by a person who does not recognize the proposition as scientific. Thus, *God is an immaterial being* is a scientific proposition, but may be treated as dialectical by a person who does not have sufficient knowledge of God.

A syllogism is made up not only of propositions, which compose or divide simple objects, but also of simple objects themselves, known by definitions. A demonstrative syllogism uses definitions of simple objects, which explain natures adequately as they are known in different sciences. Such a definition explains the principles of a nature as it is studied in a given science. For example, in moral science the definition would have to explain the voluntary nature of human acts, whereas in psychology the definition would have to explain the vital nature of human acts. However, in a dialectical syllogism we can use definitions of simple objects that are inadequate in a given science. If, in psychology, we define man as a featherless, biped animal, this definition would be dialectical because it does not define man adequately in terms of his proper principles, but inadequately in terms of common accidents.

It should be added that a definition can be dialectical in one science and scientific in another. If, in psychology, anger is defined as a desire for revenge, this definition would be dialectical. It defines anger in terms of principles of moral science rather than those of psychology. It would be a scientific definition in moral science.

Dialectical argumentation will concern a dialectical problem. A dialectical problem is an inquiry about the composition of the objects signified in the proposition. It asks whether the objects are to be united or not. For example, *Is two-footed animal a definition of man?* is a dialectical problem. There are as many dialectical problems as there are dialectical propositions. The dialectical problem adds the note of inquiry to the dialectical proposition. It inquires about something on which men either hold no opinion for or against, or where common opinion clashes with that of authorities, or where authorities differ among themselves. Dialectical problems also include questions difficult to answer because they are vast and complicated, for example, whether complete natural happiness is attainable or not.

Furthermore, every dialectical proposition or problem concerns a predicate which is either a property, a definition, a genus, or an accident. These are not to be taken merely as the predicables in the first act of the intellect; they are, rather, the actual predicates from which the dialectical propositions and problems are formed. Although, according to its universality, *animal* is an instance of the predicable

“genus” (in so far as *animal* can be said of inferiors), nevertheless it is not an actual predicate until we state a proposition or a problem, for example, is it true that man is an animal?

Having discussed the kinds of dialectical problems, we shall now list the various means to be used in reasoning dialectically. There are four common means that will supply us with reasonings for problems.

The first and most important is the ability to choose and determine the probable propositions from which we are to argue. As we have seen, we may take opinions generally held, as being likely sources of argument, or we may construct an argument based upon the authority of one qualified in the field. We may also take from a science some proposition that admits of common application to other sciences. For example, from the logical principle that contraries pertain to the same genus, we can argue that a doctor should know both health and disease.

The second means of dialectical argumentation is the ability to distinguish the various senses in which a particular expression is used. Thus, we should know how to test the meaning of a word to see whether it retains the same meaning or is ambiguous. For example, we can show that the word “sharp” has more than one meaning by examining the meaning of its contraries. If its contraries have diverse meanings, then we can argue that “sharp” also has diverse meanings. Thus, in the case of a musical note, the contrary of *sharp* is *flat*, while in the case of a blade, the contrary of *sharp* is *dull*. Since its contraries have various meanings, the word “sharp” will also have several meanings, corresponding to the meanings of its contraries.

The third means of dialectical argumentation is the ability to discover differences between things. For example, we might start with the common principle that wherever there are contraries, opposite effects are to be expected. We notice such a diversity of effects in observing the operation of the good man and the bad man, and from this we can conclude that the good man is contrary to the bad man.

The fourth means of dialectical argumentation is the ability to penetrate the likenesses of things. Thus, we can propose an argument resting upon a similarity between things that are in some way different. For example, we can argue that as *A* is to *B*, so *C* is to *D*, or, as an image is to the power of sensation, so a concept is to the power of thinking. An argument based upon similarities is very useful for induction, in which we argue from the enumeration of similar cases to a universal statement. This kind of argument is frequently used by the experimental scientist.

A treatise on dialectics should now discuss the particular means of argumentation that are proper to each of the four predicates mentioned above, namely, property, definition, genus, and accident. We shall not

go into detail on these in an elementary treatment of dialectics. Such a treatment, however, would discuss the ways of testing whether a given predicate is a property, a definition, a genus, or an accident, of its subject. Thus, in the case of a property, we should discuss whether the predicate is stated so as to be coextensive with the subject, and so on.

Dialectical argumentation is useful in at least three ways. It has the immediate and obvious use of developing skill in argument. By employing the means of dialectical argumentation, we shall see how to lay down a plan or outline of inquiry and pursue it to a tentative resolution of the problem. Secondly, dialectical argument is useful for meeting opinions held by various persons. We learn to detect views that are matters of opinion, and to deal with them dialectically in order to see what truth or error is in them. Thirdly, dialectical argument is of special use in philosophy, for by it we can raise difficulties on both sides of a question and thus dispose the ground for a demonstrative resolution of the question, if one can be made. Dialectical argument is especially needed to explain and defend the first principles of a science, since the first principles of a science cannot be demonstrated. It indicates the self-evidence of such principles and meets any attacks or objections that may be raised against the primacy and evidence of these principles. For example, we can manifest and defend the principle of contradiction dialectically.

Dialectical argumentation has a particularly important application today in the experimental physical sciences, where the inductive argument is dialectical. The universal necessity of most statements in these sciences is neither evident nor certain, but only probable. For example, we do not see why atoms have to move at the speed they do, but from several observations we construct the universal law stating that they do. We then grant its universal application.

From the knowledge of dialectical argumentation, we derive the more common notion of a dialectical process, whether in reasoning or in reality. In reasoning, the process means arguing both sides of a question, thus arriving at a resolution as to the more probable position or the one that more closely approaches the truth. As long as the process is only an approach to the truth, it remains dialectical.

The gradual approach to the knowledge of physical natures is also a dialectical process. We cannot know the proper nature, principles, and causes of many concrete things in the physical order, but we can approach closer and closer to a real knowledge of them dialectically by proposing theories or probable explanations, and then verifying them through experimentation, making better theories that explain more than the former theories, again verifying them, and so on. As with all dialectical procedure, we can approach closer to a



real explanation in terms of proper causes, but we shall never be able to achieve this unless we are able to use demonstrative argumentation.

This notion of process toward a term has also been applied to the real order in the thesis, antithesis, and synthesis of the Hegelians. They employed this process to explain the unfolding of universal being into the many particular kinds of being that now exist. The Communistic notion of the necessity of violent revolution between classes in order to arrive at a new social and economic order is another example of a dialectical process. Since this process is one that will continue to be repeated in an ever new form, it is dialectical in nature. Hence arises the significance of the phrase "dialectical materialism" as applied to the doctrine of Communism.

### III. RHETORICAL ARGUMENTATION

Rhetorical and dialectical argumentation have much in common. Both deal, more or less, with all things, not being limited to one kind of subject matter. Both discuss and defend either side of a question, and hence both proceed from probabilities, not from certainties. They proceed from common principles, not from proper principles. On all these points, dialectic and rhetoric differ from demonstrative argumentation.

Dialectic and rhetoric differ from each other in the following ways. Dialectic is an instrument for discussion and dispute in philosophy and in science, whereas rhetoric is an instrument for convincing people generally. Dialectic, for the most part, is concerned with universal questions and problems, abstracting from singular circumstances of person, place and time. Rhetoric is especially concerned with moral and political questions, which are often restricted to singular circumstances of person, place, and time. Dialectic tends to use a strict and contracted form of argumentation; rhetoric, a looser and more expansive form. Dialectic uses reasons for proving points; rhetoric uses the movement of the emotions and hence persuades rather than proves.

Rhetoric, consequently, is defined as the *ability to employ, in any given situation, the available means of persuasion*. By rhetorical argument, we seek to persuade someone on almost any subject. The rhetorician argues by using the enthymeme and the example. The enthymeme is the rhetorical syllogism and is the more effective kind of persuasion. It is an argumentation proceeding from probabilities or signs. The enthymeme has the form of an abbreviated syllogism, that is, a syllogism without one of its premises. When used by the

rhetorician, the enthymeme usually lacks the universality necessary for a proper syllogism.

For example, we might argue that John Jones should not be elected mayor because he has lived too short a time in the city. This is an enthymeme arguing from the probability, omitted in the enthymeme, that those who have lived too short a time in a city should not be elected mayor. As we have mentioned, the enthymeme does not usually have the universality necessary for the true syllogism, but it is intended to satisfy only for persuasive purposes. An example of an enthymeme arguing from a sign is, John Jones is guilty because he trembles. The condition of trembling is taken as a sign of guilt. It is evident, from this instance, that the rhetorical syllogism persuades rather than proves.

The argument from an example is like an inductive argument. When two statements are of the same order, but one is more familiar than the other, the more familiar one can be used as an example to manifest the other one. The following would be an argument of this kind. If the United States spends 70 per cent of its peacetime budget on arms, it will go to war, because Germany under Hitler did this and went to war. The instance of Germany under Hitler (or France under Napoleon) serves as a familiar example to manifest a presumed parallel situation. The argument from an example differs from a strict inductive argument in that induction derives its proof from all the particular cases, whereas the argument from an example argues from one or more particular cases to another case.

There are three modes of persuasion. The first depends upon the personal character of the speaker who, in speaking, makes us regard him as an upright person, for we are more readily inclined to believe honorable persons than others. The character of a person is usually his most effective means of persuasion. The second mode of persuasion depends upon the listeners, upon the way their emotions move in relation to the speech, for as we are emotionally inclined so are we likely to judge. The third mode of persuasion is the speech itself, the proof or apparent proof contained in the persuasive argument.<sup>1</sup>

Accordingly, the prerequisites for a good rhetorician are the following. He must be able to reason logically, for although rhetoric aims to stir the emotion of the listener so as to persuade him to accept a position, still the rhetorician must employ reasoning to accomplish such persuasion. The rhetorician must understand human character and what makes human character good, for the rhetorician has the obligation to persuade men to accept what is just or honorable or good. Finally, the rhetorician must know the emotions, their different kinds,

and how they are aroused, for persuasive argument relies upon an arousing of the emotions in order to move a person to accept a position, and to act.

There are three kinds of rhetoric, determined in relation to the listener. If the listener is one who must judge future events, then the rhetoric is *political*. For example, the listener may be a member of a legislative body, who must decide political issues, or he may be an ordinary citizen, who must decide for whom to vote. The purpose of political rhetoric is to show the expediency or harmfulness of a certain course of action.

If the listener is one who must judge past events, then the rhetoric is *forensic* or *juridical*. The listener may be a juror in the courtroom who, in hearing a case, must judge the goodness or badness of an action done previously. The purpose of forensic rhetoric is to establish the justice or injustice of a certain action.

If the listener is one who is judging what is taking place at the moment, and is concerned only with the present, the rhetoric is *ceremonial*. The listener may be hearing a speech at some banquet or other public occasion, where a testimonial is being given to an outstanding citizen. The purpose of ceremonial rhetoric is to praise or censure a human being.

Rhetorical argument is useful, for it is often the only way in which a point can be established, either because the point itself is too obscure or inevident to be manifested in any other way, or because some persons cannot be convinced at all except by persuasive argument. Further, through rhetoric we know how to use persuasion on both sides of a question, not for the purpose of actually trying to make someone believe that what is wrong is right, but in order to recognize an unfair argument when it appears, and so be able to refute it. Finally, rhetoric is a means of defending oneself by argument, and there are times when one should defend himself. Frequently, rhetoric is the only kind of argument possible, and one should use it at such a time, for one has a right to use rhetoric for any good purpose.

One should not, therefore, look down on rhetorical argument, or think that all such argument is bad or unfair because it has been employed perversely. For although great injury has been done by those who have abused rhetoric, great good has also been accomplished by those who have used it rightly.

#### IV. POETIC ARGUMENTATION

Although it may seem strange to include it in logic, poetics is nevertheless a part of rational philosophy and, in fact, is a distinct kind of argumentation. The purpose of all argumentation is to lead one to a

new truth from previous knowledge. Poetry, although the weakest form of argumentation, does lead us to new truths. In doing so poetry has its own means of inducing assent to truth. As a part of rational philosophy, poetics should consider at least the means the poet uses, the objects the poet represents, and the end of poetry. We shall be using the terms "poetics" and "poetry" in a generic sense, as referring to all works of fine art employing words and sounds as means of representation.

The poet seeks to induce assent to truth by a pleasing representation of truth. Just as forms and colors are used by the painter in his representations, so words and sounds are used by the poet. He uses words chiefly to compose metaphors and similes, whereby, because of the lack of intelligibility in contingent things, a poetically imaginative meaning is read into things. He uses sounds in a pleasing manner by the employment of rhyme, alliteration, rhythm, and so on.

Now the poet presents his truth in terms of an image, for men naturally delight in images. Indeed, in the very making of the image, the poet makes his meaning. Hence, one will attain this truth, not directly in itself, but in the image that the poet presents. By representing the image in a pleasing manner, the poet leads one to agree with his judgment. For example, Shakespeare induces us to accept the universal judgment that uncontrolled ambition can lead to a man's downfall by giving us a particular representation of this in the person and action of Macbeth. From the acceptance of this particular representation we are led to accept the universal judgment. We realize that what has happened to Macbeth could happen to ourselves or to anyone.

The image attained by the poet is in the rational order; his image is presented in words, which can be known only by the intellect. In an intimate union of sense and intellectual knowing lie the strength and appeal of the poet, for while he does attain something universal, he attains it strikingly, vividly, and familiarly, as it is realized in the singular. We see, as it were, the universal concretized. Through the image in words, a truth is conveyed, a truth contained in a judgment. Herein, then, lies the significance of the phrase "argument of the play" that we find stated as an introductory summary in a program. This rationality of the poetic image is not attained by the images of the other fine arts. For this reason, poetry is the most intellectual of the fine arts and is the only one that has argumentation, properly speaking.

The objects the poet represents are human actions of agents who are necessarily either good or bad, since it is the first property of human action to be good or bad. Consequently, in his work of representing human actions, the poet must present a judgment bearing on the

morality of these acts; the poet cannot abstract from the first property of human action. This does not mean, however, that he "moralizes" art in the sense of imposing morality upon art, but that in treating the proper matter of his art he must, as artist, observe faithfully the nature of that matter, namely, that some human actions are good and others are bad. He has the obligation as artist to represent good human action as good and bad human action as bad.

The *intrinsic* end of poetry is to represent truth and to cause delight in the knowledge of this representation. In realizing this end, the poet also introduces an order into the movement of the passions. For example, in a tragedy the poet arouses and resolves the appropriate emotions of pity and fear. We experience a certain satisfaction in this exercise of the emotions and a relief from the turbulent disorder often found in them.

The *extrinsic* end of poetry is to make men disposed to acquire virtue and to avoid vice. This is accomplished both by the acceptance of the judgment made by the poet and by the ordering of the passions (the poetic catharsis of the emotions). More men are led to the acquiring of virtue through representations than they are through reasoning bearing directly on morality. Accompanying this extrinsic end, there is the recreational effect of release from the cares and frustrations of everyday life. By introducing something of a rational order into a course of events, the poet relieves the irrationality that we often face in our daily lives.

#### QUESTIONS—CHAPTER TWENTY-TWO

1. What does "analytics" mean? Explain *prior analytics* and *posterior analytics*.
2. Why is argumentation considered first on the part of form?
3. What does it mean to know in a "discursive" manner?
4. Is the following a perfect demonstration? Explain.  
     Every animal is living.  
     Every dog is an animal.  
     Therefore, every dog is living.
5. Of what things must we have foreknowledge in order to demonstrate? In what does the foreknowledge consist in each case?
6. Define *science* in the strict sense.
7. Define *demonstration* on the part of matter. What is the relation of this definition to the definition of demonstration according to final cause?
8. Can a true conclusion follow from false premises? Explain.
9. Can every premise be proved true? Explain.
10. When is a proposition self-evident? Give examples.
11. Explain how premises are "prior" to the conclusion, "better known" than the conclusion, and "causes" of the conclusion.
12. What is the principal kind of demonstration? Illustrate with an example.
13. What is the meaning of "demonstration of the fact"?

14. What is the difference between a priori demonstration and a posteriori demonstration? What kind of division of demonstration is this?
15. How does the division of demonstration into proper cause and of the fact compare with the division of demonstration into a priori and a posteriori?
16. How does a dialectical syllogism differ from a demonstrative syllogism?
17. Explain the following statement: "We argue dialectically when we reason from probable principles which are generally held."
18. Does a probable conclusion follow probably from the premises? Explain.
19. What is a dialectical proposition?
20. When is a definition dialectical?
21. What is a dialectical problem? How does it differ from a dialectical proposition?
22. From what predicates are dialectical problems formed?
23. What are the four common means of dialectical argumentation? Give examples of each kind.
24. In what ways is dialectical argument useful?
25. What is a "dialectical process"? How is it applied to the real order?
26. What do dialectical and rhetorical argumentation have in common?
27. How does rhetorical argumentation differ from dialectical argumentation?
28. Define *rhetoric*.
29. What is an enthymeme?
30. From what does an enthymeme argue?
31. Explain the argument from example.
32. What are the modes of persuasion? Which do you think would be most effective? Why?
33. What are the prerequisites for a good rhetorician?
34. Explain the three kinds of rhetoric.
35. How is rhetorical argument useful?
36. Why is poetry considered in logic?
37. How does the poet use words and sounds?
38. Explain the role of the image in poetry. How does the poetic image lead to an assent to truth?
39. In what sense must poetry as art be moral?
40. What are the intrinsic and extrinsic ends of poetry?

## SOPHISTICAL REASONING

SOPHISTICAL reasoning is reasoning used for sophistical refutation. It appears to be genuine reasoning but actually is fallacious. Sophistics, therefore, is that part of logic concerned with the defective syllogism. A sophistic argument is a syllogism that seems to infer a conclusion from probable premises but, because of one fallacy or another, does not really do so. The defect in the argument occurs either on the part of matter alone or on the part of both matter and form.

A person who deliberately uses such fallacious reasoning is called a "sophist." A sophist is one who would rather appear to be wise than be wise without appearing so; he wishes to appear wise for his own personal gain. A sophist argues for the sake of refuting his opponent, rather than for the sake of truth. He will pursue a point fallaciously rather than admit that he is in error. The art of the sophist, as Aristotle explains, is the semblance of wisdom without the reality. By intention, therefore, the sophist deceives.

Now it is clearly not the aim of a student of logic to become a sophist. But it is the business of the student of logic to recognize a sophist, and to avoid fallacies in his own reasoning as far as possible. Let us therefore examine the kinds of fallacious reasoning in order to uncover the sources of fallacy in argumentation.

Fallacies are divided into *fallacies of language* (arising from the abuse of words) and *fallacies apart from language* (arising from the abuse of reasoning about things). We shall consider fallacies of language first, because they are the most frequent source of sophistic argumentation.

## FALLACIES OF LANGUAGE

1. *Fallacy of equivocation*

Equivocation is the use of a word with two diverse meanings. If an argument is constructed in which one of the terms, most frequently the middle term, is used with two different meanings, the argument contains the fallacy of equivocation, as in the following example:

Whatever is immaterial is unimportant.  
 Whatever is spiritual is immaterial.  
 Therefore, whatever is spiritual is unimportant.

The equivocation in this example consists of using *immaterial* with one meaning in the major premise and with quite another meaning in the minor premise. This is also called the “fallacy of four terms,” which was referred to in the rules of the syllogism in Chapter Seventeen. In his *Sophistical Refutations*, Aristotle uses the following example, with an equivocation in the minor term:

A man who has recovered is well.  
 The sick man has recovered.  
 Therefore, the sick man is well.

2. *Fallacy of amphiboly*

Amphiboly (literally, “ambiguous speech”) is an ambiguity in a phrase or in the grammatical structure of a sentence. Dangling modifiers, pronouns with ambiguous antecedents, and misplaced modifiers are occasions of misunderstanding that lead to fallacies in logic. For example, in the sentence *He told his father that he was afraid* it is not clear who is afraid; it could be the father or the one who told his father. A less obvious, though more serious, ambiguity in grammatical structure occurs in the following argument:

Every judgment of man is liable to error.  
 God's judgment of the people of Sodom was a judgment of man.  
 Therefore, God's judgment is liable to error.

In this example, *judgment of man* in the major premise is used to signify the judgment man himself makes, which is fallible. In the minor premise, *judgment of man* is used to signify a judgment God makes of man.



### 3. *Fallacy of composition and division*

This fallacy consists in combining objects in the conclusion that were not combined or taken together in the premises, or vice versa. Such a shift may occur also from one premise to the other. Consider the following argument:

Three and two are odd and even.  
Five is three and two.  
Therefore, five is odd and even.

In the major premise, three and two must be taken separately so as to mean that three is odd and two is even. In the minor premise, five is three and two only if three and two are taken together. Because of this shift from the separation of three and two in the major premise to the composition of three and two in the minor premise, the conclusion does not properly follow.

### 4. *Fallacy of accent*

The fallacy of accent arises through a difference in accentuation of the same word and results in an ambiguity of meaning. The word "invalid" carries two quite different meanings according to whether the accent is placed on the first or second syllable. Likewise with the word "incense," for it is one thing to incense a person, at a religious service for example, and quite another to *incense* a person.

Emphasis upon different words within a sentence often gives rise to various meanings that easily cause misunderstanding. In the question *What is your friend doing?* a different meaning is implied each time the emphasis is put on a different word.

### 5. *Fallacy of form of expression*

The fallacy of form of expression arises when things different in meaning are expressed in the same form. For example, the word "inattention" is like the word "intention" in form, but "inattention" has a negative meaning whereas "intention" has a positive meaning. Hence, one would be misled by the form of expression if he were to argue that "intention" must be a negative word because it begins with the same prefix that "inattention" does.

Fallacious arguments of this kind are sometimes quite serious. A well known instance occurs in John Stuart Mill's *Utilitarianism*. In Chapter Four of the book, he gives the following argument:

The only proof capable of being given that an object is visible, is that people actually see it. The only proof that a sound is audible, is that people hear it: and so of the other sources of our experience. In like manner, I apprehend, the sole evidence it is possible to produce that anything is desirable, is that people do actually desire it.

Mills's argument is that what is seen is *visible*, what is heard is *audible*, and therefore what is desired is *desirable*. But "visible" means what is actually seen and "audible" means what is actually heard, whereas "desirable" means what *should be* desired. The argument presumes that because "desirable" has the same form of expression as "visible" and "audible," it is the same in meaning.

### FALLACIES APART FROM LANGUAGE

#### 1. *Fallacy of accident*

The fallacy of accident arises from confusing an accidental attribute of a thing with what is essential to the thing, or the confusion of an accidental predicate with an essential predicate. For example, the predicate *white* is said accidentally of *man*, since it does not belong to the essence of man to be of this or that color. However, arguments are frequently given in which the color of man is confused with what is essential to man. Racism, as argued and practiced in various countries, is based on the fallacy that the accident of color, or of race, constitutes an essential difference between human beings.

Aristotle uses the following as an example of the fallacy of the accident: The product of a small number with a small number would have to be a small number: ten is a small number; one hundred is ten times ten; therefore, one hundred is a small number. It is accidental to the number one hundred that it be regarded in groups of tens, and although the groups are small in number, the number itself is not small.

Another example sometimes given is the confusion of the abuse of a thing with the use of a thing. One might thus argue, fallaciously, that no one should be allowed to drink wine because people get intoxicated by it. Likewise, one might argue, fallaciously, that private property is evil because it leads to selfishness or to the excessive accumulation of wealth.

#### 2. *Fallacy of the relative to the absolute*

This fallacy argues from what is true only relatively, or qualifiedly, to what is true absolutely, or without qualification. We can also understand that fallacy as arguing from the truth of the particular to

the truth of the universal. We are all familiar with arguments purporting to show that all members of a nation or religion are evil, or superstitious, or ignorant, because a few of the members are.

In general, this fallacy consists of using a proposition, which has a qualified meaning, as though it applied in all circumstances and without restriction. One thus argues fallaciously that the commandment "Thou shalt not kill" forbids fighting for one's country. But the meaning and context of the commandment forbids killing unjustly, that is, murdering. Again, one may argue that freedom is an absolute good, without recognizing that necessary and justifiable limitations may be placed upon freedom in different times and circumstances. The fallacy in this argument is the assumption that freedom is an absolute good rather than a good relative to an end.

### 3. *Fallacy of ignoring the issue*

This fallacy consists of refuting a point that is not the point in question, or of proving something that is not the point of issue. An example of this fallacy is the argument that a liberal education is not practical because it does not result immediately in a cash dividend.

There are various forms of the fallacy of ignoring the issue. One may confuse the person with the issue (argument *ad hominem*) by arguing that one's opponent cannot know the meaning of justice, since he never practices it. One may use emotional or physical force (argument *ad baculum*) by threatening an opponent, thus seeking to make him concede the point through fear. One may use an appeal to the audience (argument *ad populum*) by arousing their passion and prejudice, thus seeking to settle the matter emotionally rather than upon its own merits. One may use an argument from misplaced authority (argument *ad verecundiam*) by arguing from the authority a man has in one field as though it held equally well in another. For example, one might seek to prove or disprove freedom of the will from the authority of an experimental scientist.

### 4. *Fallacy of begging the question*

This fallacy arises from presupposing in the premises the conclusion that has to be demonstrated from the premises. Thus, one might argue that to return borrowed money is right because justice is a virtue. But justice as a virtue means that one should give to others what is due to them. Therefore, one cannot assume in the premises that justice is a virtue, since he is trying to prove that a certain action is right, that is, virtuous, in the conclusion.

Arguing in a circle is an extended form of begging the question.

A circular argument occurs when a premise is used to prove a conclusion, and then the conclusion is used to prove the premise. For example, one might try to arrive at the existence of God from the idea of God as existing in the human mind. If he then tried to argue the reliability of the human powers of knowing from the existence of God, he would be arguing in a circle.

### 5. *Fallacy of the consequent*

This fallacy consists of supposing that because the consequent necessarily follows from the antecedent, then the antecedent necessarily follows from the consequent. Thus, because it is true that if *X is* then *Y is* (from antecedent to consequent), one might also suppose the reverse, that if *Y is* then *X is* (consequent to antecedent). Hence, one might argue, if whenever it rains the ground is wet, then if the ground is wet it has rained.

We considered the relation of the consequent to the antecedent when we discussed the conditional syllogism in Chapter Twenty. Just as there are two valid ways of concluding the conditional syllogism, so there are two invalid ways, which we shall recall here. In affirmative arguments, the fallacy of the consequent arises by affirming the consequent in the minor premise and then affirming the antecedent in the conclusion, as in the following:

If something is generated, it has a beginning.  
The human soul has a beginning.  
Therefore, the human soul is generated.

In negative arguments, the fallacy of the consequent arises by denying the antecedent in the minor premise and the consequent in the conclusion:

If something is generated, it has a beginning.  
The human soul is not generated.  
Therefore, the human soul does not have a beginning.

### 6. *Fallacy of the false cause*

The fallacy of the false cause supposes that something is the cause of an effect when in reality it is not. Thus, something might be assumed to be a cause merely because it is prior in time. This particular form of the fallacy is often referred to as *post hoc, ergo propter hoc* (after this, therefore because of this); for example, morning comes after night, therefore morning is caused by night. Again, one might suppose that, what accompanies an action is the cause of that action;

for example, because one's arms swing when walking, therefore the swinging of the arms is the cause of the walking. Or, finally, one might suppose that a condition is a cause, for example, that light is the cause of seeing.

*7. Fallacy of the complex question*

This fallacy puts questions in such a way that any answer given implies more than a simple admission. The question asked is usually a complex one to which a simple "Yes" or "No" cannot be given. Thus, someone might ask: "Was the impeachment of President Andrew Johnson justifiable and constitutional?" The answer seems to be that it was constitutional but not justifiable, and in such a case a simple answer of "Yes" or "No" would not suffice.

Under this fallacy is included a question so worded as to place the answerer in an unfair, if not impossible, position. The famous question "Have you stopped beating your wife?" is an instance of this type of fallacy. If one answers "Yes" to the question, he implies that he has been beating his wife. If he answers "No," he implies that he is still beating her. This type of question is called a "leading question" and is ruled out of court in legal debates.



*EXERCISE ON FALLACIES—CHAPTER TWENTY-THREE*

There is no complete enumeration of the kinds of fallacies. They cannot be exhaustively classified because the errors the human intellect can make are infinite. Hence, it is not so important to name the kind of fallacy as it is to see that a process of reasoning is fallacious and to see how it can be refuted. In each of the following exercises, examine the reasoning to see where the fallacy lies and how it can be refuted. If possible, name the kind of fallacy.

1. Whoever has a virtue has the mean.  
Whoever is mean is nasty.  
Therefore, whoever has a virtue is nasty.
  
2. Many college students have great ability and are conscientious workers.  
John Jones, for instance, is a conscientious worker.  
Therefore, John Jones must have great ability.
  
3. He who studies least learns least.  
He who studies most has least to learn.  
Therefore, he who studies most learns least.
  
4. It is either raining or it is not raining.  
It is not raining.  
Therefore, it is raining.
  
5. When thoroughly stewed, you remove the bones torn the chicken.
  
6. The management reserves the right to exclude any man or woman they think proper.

7. The college newspaper quoted the senior class president as saying that half of the freshman were dumb. In the next issue of the paper, the senior class president had a letter printed, saying: "I was misquoted. What I said was that half of the freshmen were *not* dumb."
8. It is certainly true that if a person has been running rapidly, then he is short of breath. It must be just as true that if a person is short of breath, then he has been running rapidly.
9. Some girls are attractive.  
Betty is some girl.  
Therefore, Betty is attractive.
10. No prophet is honored in his home town. I observe that I am not honored in my home town. So I can only conclude that I am a prophet.
11. The following account appeared in a newspaper:

Is there a God? This question was answered in the negative by a retired professor of philosophy. "There are so many concepts of God that to answer the question about His existence flatly is to get nowhere," he stated. No good God, he continued, would permit the suffering that is rampant throughout the world. He cited the example of the agony thousands of small children went through during World War II. To say this is due to the sins of their parents or that boys and girls will receive their reward in heaven is begging the question.

After all, he went on, man is only one of many creatures that have been on top of the heap in the world's struggle. And man came along late in the process of evolution. "I'm sure if the dogs ever had a convention, they would as certainly proclaim themselves leaders of the world as we human beings do," he observed.

The retired professor of philosophy prefers to be known as a "reverent agnostic." He looks like the pastor of a fashionable church. He believes people should lead an intelligent, decent, honest, humanitarian life. "Such a life depends on getting at the truth about the world in which we live and ourselves and in having faith in mankind," he said.

"I want everyone to live the most livable life possible," he concluded.
12. He killed his daughter Ruth and is therefore ruthless.



13. Alcohol is commonly recognized as a germicide. It is a known fact that most germs are carried in the blood stream. Therefore, in order to stay healthy, we should keep a sufficient quantity of alcohol in the blood at all times.
14. Nothing is better than heaven.  
Half a loaf is better than nothing.  
Therefore, half a loaf is better than heaven.
15. The distinguished visiting lecturer concluded with the following words:  
“Now if all nature were adaptive and every part of an organism were to fit as the parts of a watch, the argument from design might hold. But think of man’s vermiform appendix that is not only useless but often a source of grave danger and death; think of his useless ear muscles that are present but can accomplish no useful function; think of the functionless breasts of males; think of the vestigial tail, the ill-adapted wisdom teeth, etc. Does it seem reasonable to suppose that these useless structures were designed in their present form? If some parts of an organism are obviously not designed, is it likely that others were designed and that the useless parts merely slipped in by mistake? Such considerations as these, and others equally conclusive, make it impossible for us, as seekers after truth, to accept the view that adaptation in nature is the result of intelligent design.”
16. All men are human.  
No women are men.  
Therefore, no women are human.
17. The newspaper reported the arrival by plane of Professor X, whose latest book on *Comparative Intelligence of Insects and Men* has caused a stir in intellectual circles. Professor X gave the following quotation to the press:  
“The majority of species have degenerated and become extinct, or, what is perhaps worse, gradually lost many of their functions. The ancestors of oysters and barnacles had heads. Snakes have lost their limbs, and penguins their power of flight. Man may just as easily lose his intelligence.”
18. Radio commercial: “Our automobiles are out of this world. Come down and see them.”

19. Sign on a construction job: S l o w M e n W o r k i n g .
20. The invention of machinery increased productivity. Increased productivity brought about the abolition of slavery. The abolition of slavery increased the dignity of man. Therefore, the invention of machinery increased the dignity of man.
21. A man held a trained flea in his right hand and said, "Jump!" The flea jumped to his left hand. He repeated the command and the flea returned to the man's right hand. Then the man removed the flea's hind legs and once again commanded, "Jump!" The flea remained where it was. This proves that the flea hears through its legs.
22. The professor of logic concluded by saying, "The only thing that is certain is that there is no certainty."
23. The existence of God is self-evident. For by the name "God" is signified that thing than which nothing greater can be conceived. But that which exists both actually and mentally is greater than that which exists mentally. Therefore, since as soon as the name "God" is understood it exists mentally, it also follows that it exists actually. Therefore, the proposition "God exists" is self-evident.
24. Communism will flourish wherever living conditions are bad and especially where there is a wide gulf between the standards of the rich and those of the poor. Eliminate bad living conditions and you eliminate Communism.
25. I asked my instructor what he thought about one of the editorials in the college paper. He said that he had not read it. He then asked everyone in the English office, but not one of them had read it. This shows how little interest the faculty takes in student affairs.

26. If you believe that voting in public office should be kept secret, then you should believe that voting in the senate should be kept secret.
27. "I shall put it to you on cold, logical grounds," concluded the Director of Statistical Research. "If there is no God then there is no absolute morality. Now it is self-evident that there is no absolute morality since everything changes and progress is ever upward. Therefore, there is no God. Besides, the notion of a God is a hang-over from medievalism and all morality is a reactionary device designed to subjugate the working people. Furthermore, freedom of speech is the only moral value that is good and all moralists attack freedom of speech, for they attack me and then hide behind the camouflage that I am illogical."
28. "If you think that our ushers are rude," said the chief usher, "you should see the manager."
29. There is no democracy in a military system. Therefore, there is tyranny in a military system and all military men are tyrants. Therefore, there would be no democracy if a military man were elected president of a country.
30. Newspaper headline: Revived Dead Woman Succumbs.
31. One is either good or bad.  
John is neither good nor bad.  
Therefore, John is not one.
32. "Madam," said the jeweler, "this ring I am offering you is really priceless."  
"In that case," said the young lady, who had just finished a course in elementary logic, "I shall give you only a dollar for it, because if it is priceless, then it is certainly worthless."

33. Catholics and Protestants are Christians.  
No men are Catholics and Protestants.  
Therefore, no men are Christians.
34. A draft official has said, "45 per cent of the eligibles are rejected because they do not meet physical standards." That winds up to drafting the best of us to protect the worst of us and leaves the least of us to run the country for the most of us.
35. All knowledge is caused by means of a likeness. But there can be no likeness of a body to an incorporeal thing. If, therefore, the soul were not a body, it could not have knowledge of corporeal things. Therefore the soul must be a body.

## *APPENDIX*



*Excerpt from*  
Commentary of St. Thomas Aquinas  
*on*  
ARISTOTLE'S *POSTERIOR ANALYTICS*

LESSON I

1. As Aristotle says in the beginning of the *Metaphysics*, the human race lives by art and reason. The Philosopher here touches upon a certain property of man by which he differs from other animals, for other animals are moved to their acts by natural instinct while man is directed in his actions by the judgment of reason. The various arts, then, serve to bring human acts to their completion in an easy and orderly manner. In fact, art is nothing else than the certain ordination of reason by which human acts arrive at their proper end through determinate means.

Now reason can direct not only the acts of the inferior powers of man, but is even directive of its own acts. It is a property of the intellective part of man to reflect upon itself, for the intellect understands itself and, similarly, reason is able to reason about its own act. Hence, just as reason reasons about the manual acts man performs such that it has devised, for example, the art of building, by which man can exercise an act of this kind easily and in an orderly way, so it is necessary to have an art that directs the very act of reason, by which man, in the very act of reasoning, may proceed in an orderly way, with ease, and without error.

2. This art is logic, i.e., rational science. It is rational not only because it is according to reason, for this is common to all the arts, but because it is concerned with the very act of reason itself as its proper matter.

3. Consequently, it is the art of arts, because it directs us in the

\* This translation is based on the text of the Leonine Edition of the *Opera Omnia* of St. Thomas Aquinas, Vol. I, pp. 138-140; Commentary on Aristotle's *Posterior Analytics*, Lesson I, nn. 1-6.

act of reason from which all the arts proceed. Therefore, the parts of logic must be taken according to the different acts of reason.

4. There are three acts of reason, the first two of which are of reason as it is a kind of understanding.

The first action of the intellect is the understanding of things that are simple or incomplex, according to which the intellect conceives what a thing is. . . . The doctrine that Aristotle treats in his book on the *Categories* is ordered to this operation of reason.

The second operation of the intellect is composition or division, in which the true or the false appears. Aristotle treats the doctrine ordered to this operation of reason in his book *On Interpretation*.

The third act of reason is properly the act of reasoning, which is to proceed discursively from one thing to another so as to arrive at a knowledge of the unknown from that which is known. The remaining books of Aristotle's logical works are ordered to this act of the intellect.

5. Now it must be noted that the acts of reasoning are similar, in a certain respect, to the acts of nature, for in this also art imitates nature so far as possible. Now three different ways of acting are found in the acts of nature. In some things, nature acts from necessity in such a way that it cannot fail. In other things, nature operates with its usual regularity, although sometimes it can fail in its proper act. Hence in these things, there must be a twofold act. One act is that which happens for the most part, as when a perfect animal is generated from a seed. The second act is that which happens when nature fails in what it is proper to it, as when, because of the corruption of some principle, a monster is generated from a seed.

These three different ways of acting are likewise found in the acts of reasoning. There is one process of reasoning inducing necessity, in which there cannot be a defect of truth. By this kind of process of reasoning the certitude of science is acquired. There is another process of reasoning in which the truth is arrived at for the most part, not, however, having necessity. There is a third process of reasoning in which reason falls away from what is true because of a defect in some principle that should have been observed in reasoning.

6. The part of logic devoted to the first process is called *judicative* because there is judgment with the certitude of science. And since we cannot have certain judgment concerning effects without resolution to first principles, this part is called *Analytics*, i.e., proceeding in the manner of resolution. Now this certitude of judgment, which is obtained by resolution, is either from the form alone of the syllogism, and the book of the *Prior Analytics*, which treats of the syllogism simply, is ordered to this; or it is also from the matter, because propositions that are essential and necessary are used, and the book of the



*Posterior Analytics*, which treats of the demonstrative syllogism is ordered to this.

The part of logic which is called the *inventive* part, is devoted to the second process of reasoning. But there is not always certitude with invention. Hence, when something is found by invention, judgment is required in order that there be certitude. Now just as in natural things which occur for the most part, a certain gradation is attained (for according as the power of nature is stronger so much the more rarely does it fail in its effect), so also in the process of reasoning which is not altogether certain, a gradation is found according to which the reasoning process approaches more or less to perfect certitude. Sometimes by this process, even though science is not obtained, nevertheless faith or opinion is obtained, because of the probability of the propositions from which the reasoning proceeds. In such a case, reason totally inclines to one part of a contradiction, although with fear of the other part. The *Topics* or *Dialectics* is ordered to this kind of reasoning, for the dialectical syllogism proceeds from probable propositions, which Aristotle treats in the book of the *Topics*.

Sometimes, however, faith or opinion is not completely obtained, but a kind of *suspicion* because reason does not totally incline to one part of a contradiction, although it inclines to one part more than to another. The *Rhetoric* is ordered to this kind of reasoning.

But sometimes there is only a judgment inclining to some part of a contradiction because of a certain representation, as when a man is brought to detest certain food because it is represented to him in the likeness of something detestable. The *Poetics* is ordered to this kind of reasoning, for poets lead us to something virtuous through a becoming representation.

Now all of these pertain to *rational philosophy*, for to induce one thing from another belongs to reason.

The part of logic called *sophistic* is devoted to the third way of reasoning, (in which reason falls away from what is true because of a defect in some principle that should have been observed in reasoning). Aristotle treats this in the book *Sophistical Refutations*.

*Excerpt from*  
**ARISTOTLE'S *ON INTERPRETATION***  
(translated from the greek)  
*with*  
**Commentary of St. Thomas Aquinas**  
(translated from the latin)\*

*Chapter One*

(16@ 1) *First we must establish what a noun is and what a verb is; then, what are negation and affirmation, and enunciation and speech.*

**LESSON I**

(Commentary of St. Thomas)

1. As the Philosopher says in the third book of *On the Soul*, there is a twofold operation of the intellect. One is called the understanding of indivisible things, by which the intellect apprehends the essence of each thing in itself; the other is the operation of composing and dividing. There is, in addition, a third operation, that of reasoning, according to which reason proceeds from known things to the inquiry of unknown things. Now, the first of these operations is ordered to the second, because there cannot be composition and division except of things simply apprehended. The second, in turn, is ordered to the third, for clearly we must proceed from some known truth, to which the intellect assents, to reach certitude about something unknown.

2. Now since logic is called the rational science, it is necessary that its consideration be directed toward those things belonging to the three operations of reason previously mentioned. Hence, Aristotle

\* This translation, both from the Greek of Aristotle and from the Latin of St. Thomas, is taken from the Leonine Edition of the *Opera Omnia* of St. Thomas, Vol. I, pp. 7-18; Commentary on Aristotle's *On Interpretation*, Chapter One, Lessons I-III. References in footnotes appear as they are in the Leonine Edition.

determines those things belonging to the first operation of the intellect, i. e., those conceived in the simple understanding, in the book *On the Categories*. Concerning those things belonging to the second operation, namely affirmative and negative enunciation, the Philosopher determines in the book *On Interpretation*. He determines those things belonging to the third operation in the book of the *Prior Analytics* and the books following it, in which he treats of the syllogism absolutely, the diverse kinds of syllogism, and the species of argumentation, in which reason proceeds from one thing to another. And thus according to the order of the three operations mentioned above, the book *On the Categories* is ordered to *On Interpretation*, which is ordered to the book of the *Prior Analytics*, and those following it.

3. Accordingly, the book which we are now examining is called *Peri Heremeneias*, that is to say, *On Interpretation*. Now an interpretation, according to Boethius, is a significant sound, which of itself signifies something, whether it is complex or incomplex. Hence, conjunctions and prepositions and other things of this kind are not called interpretations because they do not of themselves signify something. Similarly, even sounds signifying naturally but not from purpose, or with the imagination of signifying something, such as the sounds of brute animals, cannot be called interpretations, for the one who interprets intends to explain something. Hence only *nouns* and *verbs* and *speech* are called interpretations, and these he determines in this book.

However, the noun and the verb seem to be more principles of interpretation than interpretations. In fact, he seems to interpret who shows something to be true or false. Therefore, only enunciative speech, in which the true or the false is found, is called interpretation. Other kinds of speech, such as optatives and imperatives, are ordered more to expressing volition than to interpreting what is in the intellect. Therefore, this book is entitled *On Interpretation* as though it were called *On Enunciative Speech*, in which the true or false is found. Hence the noun and the verb are treated here only in so far as they are parts of the enunciation, for it is proper to each science to treat the parts of a subject as well as its passions. Therefore, it is clear to which part of philosophy this book belongs, what its necessity is, and what its place is among the books of logic.

4. The Philosopher, as an introduction to this work, explains one by one the things that are to be treated in this book. Since every science begins with the things which concern the principles, and the parts of composites are the principles of composites, therefore, whoever intends to treat of the enunciation must begin with its parts. Hence he says: *First we must establish*, i. e., define, *what a noun is*

*and what a verb is.* In the Greek it is, *First we must posit*, which signifies the same thing, for, because demonstrations presuppose definitions from which they conclude, definitions are rightly called *positions*. Hence he sets before us only definitions of the things we must treat, because from definitions other things are known.

5. If someone should ask why it was necessary here to determine more about simple dictions, namely the noun and the verb, when simple dictions were treated in the book *On the Categories*, the answer is that simple dictions can be considered in three ways. The first way is as they signify, absolutely, simple apprehensions, and this consideration belongs to the book *On the Categories*. In another way, simple dictions can be considered according to the formality of parts of the enunciation, and it is in this way that they are determined in this book. Hence, they are treated here under the formality of noun and verb, and under this formality they signify something with time or without time, and other things of this kind, which belong to the notion of dictions as they constitute an enunciation. In a third way, simple dictions are considered according as the syllogistic order is constituted from them, and he thus determines about them under the formality of terms in the book of the *Prior Analytics*.

6. It might also be asked why, having made no mention of the other parts of speech, he determines about the noun and the verb alone. To this it must be said that, because he intends to determine about simple enunciation, it suffices to treat only those parts of the enunciation from which of necessity simple speech is made up.<sup>1</sup> Now a simple enunciation can be made up of only a noun and a verb, but it cannot be made up from other parts of speech without these. Hence it was sufficient for Aristotle to determine about these two. Or it can be said that only nouns and verbs are the principal parts of speech. Pronouns, which do not name a nature but determine a person and hence are put in place of nouns, are comprehended under nouns. The participle, which signifies with time, although it may also have similarities with the noun, is comprehended under the verb. The others are more connectives of the parts of speech, signifying a relation of one to another, than parts of speech themselves, as nails and other things of this kind are not parts of a ship, but things joining together the parts of a ship.

7. He now adds, as though having set forth these things as principles, the things that belong to the principal intention, saying, *then what are negation and affirmation*, which are parts of the enunciation. They

<sup>1</sup> The editor of the Leonine Edition of the *Opera Omnia* of St. Thomas Aquinas suggests this alternate reading: "... it is sufficient to treat only those parts of speech from which the simple enunciation is of necessity made up."

are not, however, integral parts as the noun and the verb are (otherwise every enunciation would have to be composed from affirmation and negation), but *subjective* parts, i. e., *species*. This point is supposed here but will be made clear later.

8. The following question might arise. Since enunciation is divided into *categorical* and *hypothetical*, why does he not mention these along with affirmation and negation? This can be answered by saying that the hypothetical enunciation is composed from many categorical propositions; hence, they do not differ except according to the difference of one and many. It can also be answered, and better, that the hypothetical enunciation does not contain absolute truth, the knowledge of which is required in demonstration, and to which this book is principally ordered. The hypothetical enunciation signifies something as true by supposition, which is not sufficient for a demonstrative science unless it is confirmed by the absolute truth of simple enunciation. For this reason Aristotle omitted the treatment of hypothetical enunciations and syllogisms. But he adds *and enunciation*, which is the genus of negation and affirmation; he also adds *and speech*, which is the genus of enunciation.

9. If someone should ask further why he does not mention something about vocal sound, it must be answered that vocal sound is something natural. Hence it pertains to the consideration of natural philosophy, as is clear in the second book of *On the Soul* and at the end of *On the Generation of Animals*. Hence, also, vocal sound is not properly the genus of speech but is assumed for the formation of speech, just as natural things are assumed for the formation of artificial things.

10. It seems, also, that the order of the enunciation<sup>2</sup> is inverted, for affirmation is naturally prior to negation, and enunciation, as a genus, is prior to these, and consequently, speech to enunciation. But it must be said that, because he had begun to enumerate from the parts, he proceeds from the parts to the whole. Now, for the same reason he places negation, which contains division, before affirmation, which consists in composition, because division approaches more to the parts, composition more to the whole. Or it can also be said, according to some, that he places negation first because, in those things which can be and not be, non-being, which signifies negation, is prior to being, which signifies affirmation. But, although he places negation before affirmation, they are simultaneous in nature because they are species equally dividing a genus. Hence he does not refer to the fact that one of them is placed before the other.

<sup>2</sup> Suggested reading by the editor of the Leonine Edition: "... order of *enumeration*. . . ."

## ARISTOTLE'S ON INTERPRETATION

### *Chapter One (continued)*

(16@ 3) *Those things, therefore, that are in vocal sound are signs of the passions that are in the soul, and those things that are written are signs of those that are in vocal sound.*

*And just as letters are not the same for all men so neither are vocal sounds the same:*

*But the passions of the soul, of which these (i.e., vocal sounds), are the first signs, are the same for all; and also the things of which these (i.e., passions of the soul) are similitudes are the same.*

*We have spoken of these in the things that are said about the soul, for it belongs to another treatise.*

### LESSON II

#### (Commentary of St. Thomas)

1. Having set forth an introduction, the Philosopher begins to follow out what was proposed. And because those things of which he promised to speak are significant vocal sounds, whether complex or incomplex, he begins with a treatment of the *signification* of vocal sounds; he then determines about significant vocal sounds, of which he had promised to speak in the beginning. He does this where he says: *The noun then is a vocal sound significant, etc.*<sup>1</sup>

With respect to the signification of vocal sounds, he makes two divisions. First, he determines what kind of signification vocal sound has; secondly, he shows the difference between the signification of complex vocal sounds and incomplex vocal sounds, where he says: *Now as sometimes there is, etc.*<sup>2</sup> Concerning the kind of signification vocal sound has, he makes two divisions. First, he sets forth the order

<sup>1</sup> Cf. Lesson IV of Commentary of St. Thomas; in Aristotle's *On Interpretation*, at the beginning of Chapter 2, 16" 19.

<sup>2</sup> Cf. Lesson III of Commentary of St. Thomas; in Aristotle's *On Interpretation*, at line 16" 9.

of the signification of vocal sound; secondly, he shows what kind of signification vocal sound has, whether it is by nature or by imposition, where he says: *And just as letters are not*, etc.

2. It must be considered, therefore, that he proposes three things concerning the first point, from one of which a fourth is understood. He proposes *writing*, *vocal sounds*, and *passions of the soul* from which *things* are understood, for a passion exists from the impression of some agent, and thus passions of the soul have their origin from things themselves.

Now if man were by nature a solitary animal, the passions of the soul, by which he would be conformed to things themselves so that the knowledge of them would be in him, would be sufficient for him. Man, however, is naturally a political and social animal, and hence it has been necessary that the conceptions of one man be made known to others, which comes about through vocal sound. Therefore, it was necessary that there be significant vocal sounds so that men might live together. Consequently, those who have diverse languages cannot live well together.

Again, if man used only sensitive cognition, which regards only the here and now, such significant vocal sound would be sufficient for him to live with others, as is the case in the other animals, who manifest their conceptions to each other through certain sounds. Man, however, also uses intellectual cognition, which abstracts from the here and now. He is concerned not only with things present according to time and place, but also with things distant in place and future in time. Hence, in order that man might manifest his conceptions to those distant according to place and to those who will come in future time, the use of writing was necessary.

3. Now because logic is ordered to knowledge that must be taken from things, the signification of vocal sound, which is immediate to the very conceptions of the intellect, belongs to its principal consideration. The signification of letters, however, being more remote, does not belong to the consideration of logic, but rather to the consideration of the grammarian. Therefore he does not begin explaining the order of signification from letters but from vocal sounds, of which, explaining the signification, he says, first: *Those things, therefore, that are in vocal sound are signs of the passions that are in the soul*. Now he says *therefore* as if concluding from premises, because he had said above that we must determine about the noun and the verb and the other things mentioned before. These, however, are significant vocal sounds. Therefore, the signification of vocal sounds must be explained.

4. Now he uses this mode of speaking, saying, *those things that*

are in vocal sound, and not, *vocal sounds*, as if he were continuing with what he had said before. He had said we must speak of the noun and the verb and other things of this kind. Now these things have *being* in three ways: in one way, in the conception of the intellect; in another way, in the utterance of the voice; in the third way, in the writing of letters. Therefore he says, *those things that are in vocal sound*, etc., as if he were saying, nouns and verbs and the other things he had said must be defined, in so far as they are in vocal sound, are signs. . . .

5. When he says, *of the passions that are in the soul*, it must be considered that passions of the soul are commonly called the affections of the sensible appetite, as anger, joy, and other things of this kind, as is said in the second book of the *Ethics*.<sup>34</sup> And it is true that certain sounds of men naturally signify passions of this kind, as the groans of the sick, and of other animals, as is said in the first book of the *Politics*. But now the discourse is about vocal sounds significant by human institution and hence passions of the soul must be understood here as conceptions of the intellect, which nouns and verbs signify immediately, according to the teaching of Aristotle. They cannot immediately signify things themselves, as appears from the mode of signifying, for this noun *man* signifies human nature in abstraction from singulars. Hence it cannot immediately signify the singular man. And for this reason the Platonists held that it signified the separated idea itself of man. However, *man* according to its abstraction does not subsist really, according to the teaching of Aristotle, but is only in the intellect, hence it was necessary for Aristotle to say that vocal sounds signify the conceptions of the intellect immediately and things by means of them.

6. But because it is not customary for Aristotle to call the conceptions of the intellect *passions*, Andronicus took the position that this book was not Aristotle's. But we clearly find in the first book of *On the Soul*<sup>5</sup> that he calls all the operations of the soul, passions of the soul. Hence the very conception of the intellect can be called a passion. It can be called so, either because we do not understand without a phantasm, which we cannot have without a corporeal passion, and hence the Philosopher in the third book of *On the Soul*<sup>6</sup> calls the imaginative power the passive intellect; or,

<sup>3</sup> Aristotle's *Ethics*, Book II, Chap. 5; Commentary of St. Thomas, Lesson V.

<sup>4</sup> Aristotle's *Politics*, Book I, Chap. 2; Commentary of St. Thomas, Lesson I.

<sup>5</sup> Aristotle's *On the Soul*, Book I, Chap. 1; Commentary of St. Thomas, Lesson II.

<sup>6</sup> Aristotle's *On the Soul*, Book III, Chap. 5; Commentary of St. Thomas, Lesson



because by extension of the name *passion* to every reception, even the *understanding* itself of the possible intellect is a certain undergoing, as is said in the third book of *On the Soul*.<sup>1</sup>

He uses the name *passions* rather than *understandings*, not only because man wishes to signify to another an interior concept through vocal sound on account of some passion of the soul, for instance from love or hate, but also because the signification of vocal sound is referred to the conception of the intellect, according as the conception arises from things by way of a certain impression or passion.

7. Secondly, where he says, *and those things that are written*, etc., he treats the signification of writing. And according to Alexander, he introduces this to make the preceding opinion evident, by way of a similitude, so that the sense would be: Those things that are in vocal sound are signs of passions of the soul, just as letters are signs of vocal sound. He also makes this evident in what follows, where he says, *And just as letters are not*, etc., introducing this as if as a sign of the preceding, for that letters signify vocal sounds is indicated by the fact that just as there are diverse vocal sounds among different people, so there are diverse letters. According to this exposition, he therefore did not say, *of those letters that are in vocal sound*, but *those things that are written*, because they are called letters in both speech and writing, although they are called letters more properly as they are in writing. As they are in speech they are called elements of vocal sound. However Aristotle does not say, *just as those things that are written*, but makes a continuous narration; hence it is better to say, as Porphyry explains it, that Aristotle is proceeding to complete the order of signification further. After he has said that nouns and verbs, which are in vocal sound, are signs of those things that are in the soul, he then adds that nouns and verbs that are written are signs of those nouns and verbs that are in vocal sound.

8. Then where he says: *And just as letters are not*, etc., he shows the difference, with respect to the foregoing, between the *things signifying* and the *things signified*. Concerning this, he shows what it is to be according to nature, or not according to nature. He does three things about this. First, he posits a certain sign by which it is made evident that neither vocal sounds nor letters signify naturally. Those things that signify naturally are the same for all men. However, the signification of letters and vocal sounds, which we are now treating, is not the same for all men. This has never

<sup>1</sup> Aristotle's *On the Soul*, Book III, Chap. 4; Commentary of St. Thomas, Lesson IX.

been doubted by anyone with respect to letters, of which not only the nature of signifying is by imposition, but even their formation comes about through art. Vocal sounds, however, are formed naturally. Hence it has been questioned by some whether they signify naturally. Aristotle determines this here by a similitude with letters, which are not the same among all men, and so neither are vocal sounds the same. Hence it is clear that, like letters, vocal sounds do not signify naturally, but by human institution. However, those vocal sounds that signify naturally, as the groans of the sick and others of this kind, are the same for all men.

9. Secondly, where he says, *but the passions of the soul*, etc., he shows that the passions of the soul exist naturally, just as things exist naturally, by the fact that they are the same among all men. For this reason he says, *but the passions of the soul*, i. e., just as the passions of the soul are the same for all men . . . so also the things are the same . . . of which the passions of the soul are *similitudes*. It must be considered here that he has said that letters are signs of vocal sounds, and similarly vocal sounds are signs of passions of the soul; and he says passions of the soul are similitudes of things. Now he says this because a thing is only known by the soul through some similitude of the thing existing either in the sense or in the intellect. But letters are signs of vocal sounds, and vocal sounds of passions, in such a way that one's attention is not directed to the notion of similitude, but only the notion of institution, just as in many other signs, as in a trumpet as a sign of war. In the passions of the soul, however, the notion of similitude, to express things, must be considered because passions of the soul designate things naturally, and not by institution.

10. However, some object to this position that passions of the soul, which vocal sounds signify, are the same for all. First, because diverse men have diverse opinions about things, and so the passions of the soul do not seem to be the same for all men. To this Boethius replies that Aristotle here designates by passions of the soul the conceptions of the intellect, which is never deceived. Thus the conceptions of the intellect must be the same among all, for if anyone differs from the true it is because he does not understand. But because what is false can also be in the intellect, according as the intellect composes and divides, but not according as it knows *that which is*, i. e., the essence of a thing, as is said in the third book of *On the Soul*,<sup>8</sup> this position must refer to the simple conceptions of the intellect (which incomplex vocal sounds signify). These are the same

<sup>8</sup> Aristotle's' *On the Soul*, Book III, Chap. 6; Commentary of St. Thomas, Lesson XI.

among all men, because if anyone truly understands what man is, whatever other thing than man he apprehends, he does not understand man. Simple conceptions of the intellect, which vocal sounds first signify, are of this kind. For this reason it is said in the fourth book of the *Metaphysics*<sup>9</sup> that the notion that the name signifies is the definition. Hence he says, significantly, *of the first of which these are signs*, namely as referring to the first conceptions signified first by vocal sounds.

11. Some also raise the objection based on equivocal names, in which the same vocal sound does not signify the same passion among all men. Porphyry answers this by saying that a man who produces vocal sound refers it to signify one conception of the intellect. If another man to whom he speaks understands something else by it, he who speaks, by explaining himself, will make the other refer the thing understood to the same thing.

But it is better to say that the intention of Aristotle is not to assert the identity of the conception of the soul through comparison to vocal sound, such that of one vocal sound there is one conception, for vocal sounds are diverse among different people; but that he intends to assert the identity of the conceptions of the soul by comparison to things, which he likewise says are the same for all.

12. Thirdly, where he says: *We have spoken of these in the things*, etc., he excuses himself from a more diligent consideration of these things because he has determined in the book, *On the Soul*, the nature of the passions of the soul and in what way they are similitudes of things. This does not pertain to logic but to philosophy of nature.

<sup>9</sup> Aristotle's *Metaphysics*, Book IV, Chap. 4; Commentary of St. Thomas, Lesson VII.

## ARISTOTLE'S *ON INTERPRETATION*

### *Chapter One (continued)*

(16a 9) *Now just as there is sometimes in the soul understanding without the true or the false, but sometimes one or the other of these is necessarily present to it, so it is in vocal sound; for in composition and division there is truth and falsity.*

*Nouns and verbs themselves, then, are similar to conception without composition or division, such as "man" or "white", when nothing is added; for neither is yet true or false.*

*And a sign of this is that "goatstag" signifies something but it is not yet true or false if "to be" or "not to be" is not added, either absolutely or according to time.*

### Lesson in

(Commentary of St. Thomas)

1. After the Philosopher has treated the order of the signification of vocal sounds, he continues here with the diverse signification of vocal sounds, of which some signify the true or the false, some do not. And concerning this he does two things: first, he sets forth the difference; secondly, he makes it evident where he says, *for in composition*, etc. Now, because conceptions of the intellect are prior in the order of nature to vocal sounds, which are uttered to express them, he assigns the difference that is in the significations of vocal sounds from the similitude of the difference which is in the intellect. Thus, this manifestation is not only from a similitude but also from the cause which the effects imitate.

2. It must be considered, therefore, as it was said in the beginning, that the operation of the intellect is twofold, as it is explained in the third book of *On the Soul*.<sup>1</sup> In one of these the true and false is not found, but in the other it is found. This is why he says that

<sup>1</sup> Aristotle's *On the Soul*, Book III, Chap. 6; Commentary of St. Thomas, Lesson XI.

there is in the soul sometimes understanding without the true and false, but sometimes of necessity it has one or the other of these. And because significant vocal sounds are formed to express conceptions of the intellect, hence in order that the sign be conformed to the thing signified, it is necessary likewise that some significant sounds signify without the true and the false, but others with the true and false.

3. Then where he says, *for in composition*, etc., he makes what he has said evident. First he makes it evident with respect to what he has said about the intellect; secondly, with respect to what he has said about the similarity of vocal sounds to the intellect, where he says: *Nouns and verbs themselves, then*, etc. To show, then, that the intellect sometimes is without the true and the false, and sometimes is with one of these, he says, first, that truth and falsity is in *composition* and *division*. Here it must be understood that one of the two operations of the intellect is the knowing of indivisible things, in so far as the intellect understands absolutely the *quiddity* or *essence* of anything, for instance, *what* man is or *what* white is or *what* something else of this kind is. The other operation of the intellect is the composing and dividing of simple concepts of this kind. He says, therefore, that in this second operation of the intellect, i. e., of composing and dividing, truth or falsity is found, and so neither is found in the first operation, as is also said in the third book of *On the Soul*.<sup>2</sup>

4. There seems to be a doubt about this first point; since division comes about through resolution to indivisible or simple things, it seems that just as there is not truth or falsity in simple things, so neither is there in division.

It must be said, however, that since the conceptions of the intellect are similitudes of things, the things in the intellect can be considered and named in two ways: in one way, *according to themselves*; in another way, *according to the natures of things* of which they are similitudes. For instance the image of Hercules according to itself is called bronze and is bronze; but in so far as it is a likeness of Hercules it is named *man*. Thus also, if we consider the things in the intellect according to themselves, there is always composition and then there is truth and falsity, which is found in the intellect only when the intellect compares one simple concept to another. But if what is in the intellect is referred to the thing, sometimes it is called composition, sometimes division: composition, when the intellect compares one concept to another as if apprehending the

<sup>2</sup> *Ibid.*

*conjunction* or identity of the things of which they are conceptions; *division*, when it so compares one concept to another that it apprehends the things to be diverse. Considered in this second way, affirmation in vocal sounds is called composition in so far as it signifies conjunction on the part of the thing; negation is called division in so far as it signifies the separation of things.

5. Again, it seems that truth does not consist only in composition and division. First, because a thing is also said to be true or false; for example, gold is said to be true or false. It is said also that being and true are convertible. Hence, it seems that even the simple conception of the intellect, which is a likeness of the thing, does not lack truth and falsity.

Furthermore, the Philosopher says in the book *On the Soul*<sup>3</sup> that the sensation of proper sensibles is always true. But sensation does not compose or divide. Therefore, truth is not only in composition or division.

Again, in the divine intellect there is no composition, as is proved in the twelfth book of the *Metaphysics*<sup>4</sup> and nevertheless the first and highest truth is found there. Therefore, truth is not only in composition and division.

6. To answer these objections, it must be considered that truth is found in something in two ways: in one way, as it is in that which is true; in another way, as it is in speaking or knowing what is true. Now truth is found in that which is true in both simple things and composite things, but truth is found in speaking and knowing what is true, only according to composition and division. This is made clear in what follows.

7. The true, as the Philosopher says in the sixth book of the *Ethics*,<sup>5</sup> is the good of the intellect. Hence whatever is said to be true must be said in relation to an intellect. Now vocal sounds are compared to the intellect as signs, but things are compared to the intellect as things of which the conceptions of the intellect are similitudes. But it must be considered that a thing is compared to the intellect in two ways. In one way, as the measure to the measured, and thus natural things are compared to the human *speculative* intellect. For this reason, the intellect is called true as it is conformed to the thing, but false as it disagrees with the thing.

A natural thing, however, is not said to be true by comparison to

<sup>3</sup> Aristotle's *On the Soul*, Book II, Chap. 6; Commentary of St. Thomas, Lesson XIII.

<sup>4</sup> Aristotle's *Metaphysics*, Book XII, Chap. 7; Commentary of St. Thomas, Lesson VII.

<sup>5</sup> Aristotle's *Ethics*, Book VI, Chap. 2; Commentary of St. Thomas, Lesson II.

our intellect, as certain ancient natural philosophers held, thinking the truth of things consisted only in *being seen*. According to this it would follow that contradictories would be at the same time true, since contradictories fall under opinions of different men. However, some things are called true or false by comparison to our intellect, not *essentially* or *formally*, but *effectively*, in so far as they are naturally apt of themselves to bring about a true or false estimation. It is thus that gold is called true or false.

In another way things are compared to the intellect as the measured to the measure. This is evident in the *practical* intellect, which is a cause of things. Hence the work of an artisan is said to be true in so far as it approaches practical reason as the measure (*ratio*) of art; false, in so far as it is deficient in relation to practical reason as the measure of art.

8. Since all natural things are compared to the divine intellect as artifacts to art, it follows that anything is said to be true according as it has the proper form by which it imitates divine art. Thus, false gold is true copper. In this way *being* and *true* are convertible, because any natural thing is conformed to divine art through its form. Hence the Philosopher, in the first book of the *Physics*, calls form something divine.<sup>6</sup>

9. Furthermore, just as a thing is called true by comparison to its measure, so also the sense or the intellect is called true, whose measure is the thing outside the soul. Hence, the sense is called true when through its form (species) it is conformed to the thing existing outside the soul. Thus it is understood that the sensation of the proper sensible is true. In this way also the intellect, apprehending the essence of a thing apart from composition and division, is always true, as is said in the third book of *On the Soul*.<sup>7</sup>

It must be considered, however, that although the sensation of the proper object is true, nevertheless, the sense does not know this to be true, for it cannot know the relationship of its conformity to the thing but only apprehends the thing. The intellect, however, can know the relationship of this kind of conformity, and hence only the intellect can know truth. For this reason the Philosopher says in the sixth book of the *Metaphysics* <sup>8</sup> that truth is only in the mind, as in one knowing truth. But to know this relationship of conformity is simply to judge it to be or not to be so in reality, which

<sup>6</sup> Aristotle's *Physics*, Book I, Chap. 9; Commentary of St. Thomas, Lesson XV.

<sup>7</sup> Aristotle's *On the Soul*, Book III, Chap. 9; Commentary of St. Thomas, Lesson VI.

<sup>8</sup> Aristotle's *Metaphysics*, Book VI, Chap. 4; Commentary of St. Thomas, Lesson IV.

is to compose and divide, and hence the intellect does not know truth except by composing or dividing through judgment. This judgment, if it is in accordance with things, will be true, for instance, when the intellect judges a thing to be what it is, or not to be what it is not. The judgment will be false when it is not in accordance with the thing, namely, when it judges that what is, is not, or that what is not, is. Consequently, it is clear that truth and falsity as it is in the one knowing and the one speaking is only concerned with composition and division.

This is the way in which the Philosopher speaks here. Now because vocal sounds are signs of understanding, vocal sound will be true when signifying true understanding, but false when signifying false understanding. However, vocal sound in so far as it is a certain thing, is called true just like other things. Hence this vocal sound, *man is an ass*, is truly vocal sound and truly a sign, but because it is a sign of something false it is called false.

10. It must be known, however, that the Philosopher speaks of truth here according as it pertains to the human intellect, which judges of the conformity of things with the intellect by composing and dividing. The judgment of the divine intellect is without composition and division, for just as our intellect understands material things immaterially, so the divine intellect knows composition and division simply.

11. Then where he says: *Nouns and verbs themselves, then, etc.*, he makes evident what he has said concerning the similitude of vocal sounds to the intellect. First, he manifests what was proposed; secondly, he proves it by a sign where he says: *And a sign of this is, etc.* He concludes therefore from what has been said before that, since there is truth and falsity in the intellect only with composition and division, it follows that nouns and verbs, taken separately, are like the intellect without composition and division, as when *man* or *white* is said, if nothing else is added. For it is not true or false at this point; but when *to be* or *not to be* is added it becomes true or false.

12. A true response to a question by a single noun is not an instance against this position, as when someone asks: *What swims in the sea?* and someone answers, *fish*. The verb which was posited in the question is understood here. And just as a noun by itself does not signify the true or false, so neither does the verb said by itself.

Nor is the verb of the first and second person, nor the passive verb an instance against this position, because in these a specified and determined nominative is understood. Hence there is implicit composition, although not explicit.



13. Then where he says: *And a sign of this is*, etc., he introduces a sign from the composite noun, namely *goatstag*, which is composed from “goat” and “stag” and which in Greek is called *tragelaphos*; for *tragos* is “goat,” and *elaphos* “stag.” Nouns of this kind signify something, namely, certain simple concepts, although of composite things, and so it is not true or false except when *io be* or *not to be* is added, by which a judgment of the intellect is expressed. Now *to be* or *not to be* can be added either according to present time, which is to be or not to be in *act*, and hence is said “to be” absolutely; or according to past or future time, which is not to be absolutely, but relatively, as when it is said that something has been or will be. He expressly uses an example here of a noun signifying something that does not exist in reality, in which falsity appears immediately, and which cannot be true or false without composition and division.<sup>8</sup>

<sup>8</sup> Suggested reading by the editor of the Leonine: “. . . in which immediately the falsity would appear if it could be true or false without composition and division.”

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